NETWORK WORLD

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APPLICATION PORTABILITY

United we stand: Unix firms back API spec

BY JIM DUFFY

New York

The Unix community is at it again — unification, that is.

The Open Software Foundation, Inc. (OSF), Unix International, Inc. (UI) and X/Open Company, Ltd. last week unveiled a common application program interface (API) that will allow users to easily port applications to different versions of Unix.

The API, referred to as the common API specification, is being endorsed by 75 Unix vendors and software developers, including IBM, Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc. The specification is intended to mask dissimilarities among Unix kernels, such as OSF/1, Unix System V and vendor-specific implementations, such as IBM's AIX or HP's HP-UX.

DANILLE SWICK

OSF's David Tory (I.) and UI's Peter Cunningham.

The specification's promoters want users to be able to purchase Unix applications from any

See Unix, *page 54*

NMF building bridges among mgmt. tools

BY JIM DUFFY

Morristown, N.J.

The Network Management Forum hopes to publish this fall a specification that would allow management applications to share data regardless of the underlying transport protocols they use.

The specification, called Open Management Edge (OME), is being developed by a group of companies within the forum including Ascom AG, Comdisco Disaster Recovery Services, Inc., IBM and Network Managers, Ltd. The group is called the Action Team for the Integration of Management Systems (AIMS).

With OME, it will be possible for existing management applications using a range of protocols to interoperate with applications conforming to the forum's OMNIPoint specifications. Based on industry and de facto standard application program interfaces and protocols, OMNIPoint is a blueprint for building integrated, enterprisewide management environments.

The forum hopes OME's protocol transparency will help users migrate to OMNIPoint by allowing existing applications to coexist with OMNIPoint-compliant products. Once all applications conform to OMNIPoint, the OME code will no longer be needed.

"The Open Management Edge represents the first OMNIPoint effort that's really focused on application developers," said Beth Adams, managing director of the forum. "[OME] makes it possible for you to interoperate or exchange information with other applications in a common way."

Analysts said the forum's OME work is interesting but they are uncertain if it will meet with widespread in-

See Bridges, *page 54*

IBM officials reveal make-over blueprint for LAN Server

Network operating system to get Pentium support, other new features.

BY CHRISTINE BURNS

Orlando, Fla.

IBM officials last week told LAN Server users what they can expect in the new version of the network operating system when it rolls out early next year.

At a technical exchange for OS/2 and LAN Systems users here, IBM officials said LAN Server Version 4.0 will support Distributed Computing Environment (DCE) services, a graphical user interface (GUI), extended peer services and high-speed Pentium-based platforms.

IBM is positioning LAN Server 4.0 as the upgrade of choice for Novell, Inc. NetWare 3.11 users that do not want to migrate to NetWare 4.0 and Microsoft Corp. LAN Manager 2.1 customers worried about moving to Windows NT. IBM is hoping to attract users to LAN Server 4.0 with promises of NetWare 4.0 and LAN Manager interoperability.

"We're not confused about what's the best client or the best server to run your LAN — that's OS/2 and OS/2 LAN Server," said Art Olbert, personal products director of IBM LAN Systems. "But we're proud to say we support the others, too."

LAN Server 3.0 clients can already access LAN Manager and NetWare, but at the expense of LAN Server-based services such as security, directory and network management offerings.

LAN Server migration

	Version 3.0	Version 4.0
Open systems support	None	Distributed Computing Environment directory, security, timing and remote procedure call
Installation/ configuration	Command line, character-based	Graphical user interface
Peer services	Limit 1 peer session at a time per workstation	Multiple peer sessions supported simultaneously, supports Dynamic Data Exchange
Processor support	Intel Corp. 486	Intel Pentium

GRAPHIC BY TERRI MITCHELL

DCE-ADHERENT

The DCE support in 4.0 will let LAN Server clients interact with applications in other DCE-compliant environments. The technology makes this possible by specifying the security, directory, remote procedure call and synchronization services needed to help users build distributed computing systems. All of these DCE services will be supported by LAN Server 4.0.

Steven King, LAN Server product manager, said the Open Software Foundation, Inc.'s distributed file

See LAN Server, *page 54*

NETWARE FUTURES

Novell eyes a changing landscape

First in a two-part series.

BY CARYN GILLOOLY

Provo, Utah

Novell is at a crossroads.

For the first time in its 10 successful years in the local-area network business, observers are starting to doubt Novell, Inc. — doubt its business direction, doubt its leadership and doubt its ability to hold its own against strong competition in a fast-changing market.

Much, if not all, of the problem stems from confusion over product direction.

Novell, which has always been "The NetWare Company," is starting to put more emphasis on other areas. In fact, according to James Tolonen, Novell's chief financial officer, NetWare will only account for 50% of the company's overall revenue within about three

See Novell, *page 55*

Lotus to clear the air on mail integration

BY WAYNE ECKERSON

Lotus Development Corp. will try to clear up confusion surrounding its strategy to integrate its market-leading cc:Mail E-mail system with its Notes groupware package when it meets with cc:Mail customers at its annual user conference in two weeks.

Lotus officials are expected to outline at Interchange '93 in San Francisco plans to add a new version of cc:Mail to complement the existing version, which is based on a store-and-forward architecture. The new offering will be a client/server version that combines a cc:Mail front end with a Notes server back end, sources said.

The strategy attempts to satisfy a growing number of customers who have deployed both cc:Mail and Notes and want to reduce the headaches of maintaining separate electronic mail systems. It is also intended to ease the fears of cc:Mail users who have built enterprisewide E-mail systems based on the cc:Mail message store.

Lotus is also expected to announce the Lotus Message Switch, software that integrates the message transfer agents in cc:Mail and Notes. The new software will route cc:Mail messages to cc:Mail message stores and Notes Mail messages to a Notes database.

The Lotus Message Switch is part of a short-term strategy to bring the cc:Mail and Notes E-mail systems closer together without taking the drastic step of modifying or swapping out back-end message stores.

Lotus officials would neither confirm nor deny that they will discuss their integration strategy at the Interchange show.

See Lotus, *page 55*

Briefs

Getting in sync. Chipcom Corp. and Sync Research, Inc. are expected to finalize a strategic alliance within the next few weeks that will bring Sync's IBM Synchronous Data Link Control-to-Logical Link Control conversion technology into Chipcom's ONline System Concentrator hub, allowing ONline users to more easily integrate Systems Network Architecture and local-area network traffic. Both companies declined to comment.

Speed demon. AT&T is expected to this week announce Accunet T32, a fractional T-3 service that runs at 32M bit/sec. It will plug the gap between its 10.8M bit/sec fractional T-3 service and Accunet T45, which runs at 45M bit/sec. Accunet T32 is scheduled to be available Sept. 20. AT&T said a T32 link between Addison, Texas, and Akron, Ohio, will cost $55,000, while a similar T45 link costs $63,800.

A Clear mission. AT&T and Clear Communications Corp. announced a plan to integrate AT&T's Accumaster Management Services management system with Clear's Surveillance System. Accumaster Management Services helps users manage voice and data net services, while the Surveillance System allows users to spot circuit degradation before connections are lost.

In the wings. Da Vinci Systems Corp., based in Raleigh, N.C., this week will announce a new version of its Message Handling Service (MHS)-based mail system for DOS and Windows clients. Da Vinci eMail 2.5 will be integrated with Novell, Inc. NetWare 4.0 and Global MHS, and will also include new features, such as graphical user interface-based administrative tools and a bulletin board function.

Unified view. Unify Corp. will unveil its Unify Vision set of cross-platform tools for building large client/server applications on Sept. 21 in New York.

The new tool set will run on both Unix- and Intel Corp.-based personal computers and will include a graphical user interface builder, 4GL and other features.

Open to the core. Apple Computer, Inc. next month in Cupertino, Calif., is expected to announce new products under its Apple Open Collaborative Environment (OCE) architecture, which is designed to link electronic mail, directory and security services to let Macintosh users work together more easily.

The company is expected to detail pricing and the availability of its PowerShare server software and PowerTalk client software.

Working group. Microsoft Corp. has announced Workgroup Templates, a set of 13 customizable templates designed to help developers build work group applications using Microsoft development tools and add work group capabilities to Microsoft applications. The templates, which work with Microsoft Mail, Word, Excel and other Microsoft software, aid in coordinating meetings, tracking customers and scheduling projects.

Think about it. This week in New York, IBM is expected to announce the next generation of its ThinkPad family of notebook computers, which are expected to boast a variety of communications capabilities including support for Cellular Digital Packet Data and circuit-switched cellular services, full-motion video, multimedia, infrared communications and even a television tuner to capture video signals.

The ThinkPads have a modular design that will let users swap in the gear needed to support different communications options.

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Network HELP desk

Network World tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Susan Collins at (800) 622-1108, via fax at (508) 820-3467 or via the Internet at scollins@world.std.com.

My company has two token-ring local-area networks, one running Novell, Inc. NetWare 3.11 and the other using Banyan Systems, Inc. VINES 5.X. I would like to provide end users with concurrent access to both the NetWare and VINES servers. What's the easiest way to do this?

Dennis Booker, Dallas

Ronald Nutter, escalation manager of 900 Support, an around-the-clock Novell technical support company in Lake Oswego, Ore., replies:

Since each of the servers is on a token ring, all you should need to do is connect the two rings. This should not cause a problem; since the two servers are running different protocols, they won't see each other. To connect the rings, you can either add a second token-ring card in the VINES server or, depending on your current server load, connect the two rings via a patch cable running between the multistation access units located in the wiring closet.

Another possible solution is to check out Banyan's Enterprise Network Services (ENS). This will allow seamless integration of NetWare and Banyan environments. You will have to load a NetWare Loadable Module (NLM) on the NetWare server and additional software on the Banyan server. For more information on Banyan ENS, call Banyan at (800) 828-2404.

We're having trouble separating the responsibilities of our MIS technical support department from those of our telecommunications department. There appears to be some redundancy between the two groups. What is the demarcation between them?

John Fonner, Pittsburgh

Cheryl Currid, president of Currid & Co., a Houston-based consulting firm specializing in information technology, organizational and management issues, responds:

Most MIS support organizations have

See **Help desk**, *page 25*

CONTENTS

TYPICAL SOLUTIONS WOULD BE FINE IF EVERYONE WERE TYPICAL.

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IBM to unwrap variety of products for AS/400

Included are improved TCP/IP support, new apps.

BY MICHAEL COONEY

New York

IBM this week will unwrap a variety of new hardware, software and networking products for its AS/400 in an effort to fortify the mid-range computer's position in enterprise networks.

The products are expected to include three new Application System/400 models preconfigured as local-area network or database servers, improved Transmission Control Protocol/Internet Protocol support, frame relay software and new client/server applications.

An IBM spokeswoman acknowledged that the company would make an AS/400 announcement but would not confirm details.

"With these announcements, IBM is moving aggressively to open the AS/400 system and support whatever the marketplace says it wants," said Ken Sobel-Feldman, president of the Sage Associates consultancy in Stamford, Conn. "The AS/400 no longer follows the old IBM strategy that its own standards are the best — it will support everything."

First out of the chute will be the AS/400 Models 100, 135 and 140, machines stripped of all extraneous computing functions and designed specifically to handle file, LAN or SQL database serving duties.

The new boxes, which were expected (*NW*, July 5, page 1), will include servers preconfigured for Apple Computer, Inc. and Novell, Inc. NetWare environments. IBM will roll out an AS/400 version of its LAN Resource Extension (LANRES) software, enabling the AS/400 to act as a NetWare server. Until now, LANRES was available on mainframe boxes. It was unclear exactly how Apple support would be delivered.

Although they are based on the low-end AS/400 9404, the new models will include specialized processors and fine-tuned OS/400 operating system code to give the servers as much as three times the performance of existing 9404s.

The servers are expected to support Apple's Data Access Language, Sun's Network File System and Oracle Corp's SQL*Connect application program interface.

NEW CAPABILITIES ABOUND

A new version of the AS/400's operating system, OS/400 Version 2 Release 4, will bring an assortment of new features, including an integrated TCP/IP communications stack that will obviate the need for users to buy a separate TCP/IP package.

IBM is expected to improve its TCP/IP Telnet support with a feature that lets users employ Telnet even when accessing an AS/400 across multiple network hops. Today, a personal computer has to be directly connected to an AS/400 to employ Telnet, which is the TCP/IP virtual terminal protocol.

The new operating system is also expected to bring data terminal equipment frame relay support to the AS/400, letting users link the box to 56K bit/sec frame relay services.

IBM will also add at least one T-1 interface to the AS/400, sources said. Today, the largest AS/400s support up to 64 56K bit/sec Synchronous Data Link Control links, but no T-1 links.

Details were skimpy, but sources said new third-party vendors will add products to IBM's fledgling Client Series and Server Series products.

AS/400 facts

- The performance of high-end AS/400s has increased an average of 60% to 70% a year since 1988.
- AS/400s can support the attachment of 2 - 2,400 devices, depending on the size of the unit.
- There are more than 225,000 AS/400s installed worldwide.

SOURCE: IBM, WHITE PLAINS, N.Y.
GRAPHIC BY TERRI MITCHELL

The Client Series is a group of multivendor applications that are tested, approved and guaranteed by IBM to work as clients to AS/400 servers. These include Wall Data, Inc.'s Rumba and Apple's SNA.ps 5250 products.

With the Server Series, IBM ships an AS/400 with fully configured Personal System/2s ready to be installed on a Token-Ring or Ethernet LAN. The package includes OS/400, PC Support/400, LAN drivers and DOS.

"IBM wants to exploit these services to further integrate the AS/400 into client/server environments," Sobel-Feldman said.

Sources said almost all of the new products will be available by the end of the year. Pricing was unavailable.

MCI increases private-line rates by 4%

BY BILL BURCH

Washington, D.C.

Rounding out its Aug. 6 price increases, MCI Communications Corp. last week raised its digital private-line services an average of 4%.

The amount of the changes varies by service. For example, T-1 charges are going up 4% for fixed-rate contracts and 4.29% when the facilities are leased on a per-mile basis.

For digital data service, MCI is raising rates 3.9% for fixed and 3.7% for per-mile contracts.

Other services affected are T-3 links and voice-grade private lines, which will see price hikes of 4% on average.

The rate increases took effect Sept. 1.

Even though private-line rates are going up, users will come out about even due to earlier reductions in access costs, according to Daniel Briere, president of TeleChoice, Inc. in Verona, N.J.

Long term, Briere said he believes that the company wants to raise its private-line rates in order to encourage users to switch to public services such as frame relay.

"Five years from now," he said, "it's going to be a very tough case to argue that you should have private-line networks, given the improvements that are going to take place in network management, user control of networks, outsourcing options and structural price changes."

SECURITY

U.S. government seeks new global security guidelines

BY ELLEN MESSMER

Baltimore, Md.

The U.S. government next year plans to replace its guidelines for evaluating the security capabilities of information technology products with new criteria that would widen the focus on network and data access products.

Called the Common Criteria, the new guidelines would be developed in conjunction with Canada, Europe and Japan, and submitted as a proposed standard to the International Standards Organization. Since government users everywhere have to buy formally evaluated products to protect sensitive data, the Common Criteria would open an international market in "trusted systems."

Earlier U.S. security criteria — outlined in the so-called Red Book and Orange Book — did not pay sufficient attention to networking and database access systems, government officials acknowledged.

"We need to address distributed systems, networks, encryption and PC security," said Janet Cugini, computer scientist at the National Institute of Standards and Technology (NIST), who last week outlined the government's plans in a presentation to the Computer Systems Security and Privacy Advisory Board, which counsels Congress on security issues.

The government's emphasis on security in operating systems is out of touch with current realities, Cugini pointed out, adding, "People said, 'I have 30 DOS machines connected to a LAN, and you're not addressing my needs.' They're using routers and packet filters to keep track of what's on their networks."

LAMBERT

Product testing, in which vendors submit their products to the National Security Agency (NSA) to earn a grade ranging from a high of A1 to a low of D, is a time-consuming and expensive process.

Very few network and database products have made it through the NSA evaluation process. The new plans call for the U.S. to emulate the European model, where governments do not conduct the evaluations themselves, but accredit commercial laboratories for product testing.

In 1991, after five years of evaluation, Verdix Corp.'s Multi-Level Secure LAN was the first networking product to earn a B2 rating based on the product's audit features and mandatory and discretionary access controls.

Novell, Inc. and a team of vendors recently announced a cooperative effort to seek a C2 rating — which defines discretionary access controls, user identifications and passwords — from NSA for a secured version of NetWare (*NW*, July 12, page 1). Sources said that effort will take two years and cost Novell $17 million.

Next week, Informix Software, Inc. is expected to announce that its Informix-OnLine/Secure relational database will become the first database to achieve B1- and C2-level security certification by NSA.

"High-assurance evaluation will continue to be done at NSA," said Stuart Katzke, chief of the computer security division at NIST, about the planned Trust Technology Access Program. "But other types of products would be done in the labs."

"There are many applications where today's C2 is an appropriate level of trust," said Patrick Gallagher, director of the NSA's National Computer Security Center. "Tomorrow, the center may not do that [testing] but will accept the results of the test."

Government officials said they believe that moving the evaluation tests closer to the vendor community will promote product testing and lower testing costs.

Government officials have invited repre-

See **Security**, *page 5*

NW adds new columnists

Network World welcomes two new columnists who will offer analysis and commentary on technology trends and news events each week.

Mark Gibbs, whose Net Results column appears in the Local Networks section (see page 15), was cofounder of Novell, Inc.'s U.K. operations and is now an independent consultant and writer.

Gibbs, a frequent contributor to *NW*, is the author of several books including *The Absolute Beginner's Guide to Networking*, *Navigating the Internet* and *Networking Personal Computers, Third Edition*.

Based in Ventura, Calif., Gibbs will cover key issues including local-area network management, applications, capacity planning and working with users and management.

David Rohde will offer his insights on tariff and pricing changes for local and long-haul services, as well as new service and billing issues, in his Rate & Tariff Monitor in Global Services (see page 26).

Rohde is associate publisher with Rockville, Md.-based Center for Communications Management Information (CCMI), a provider of rate and tariff information.

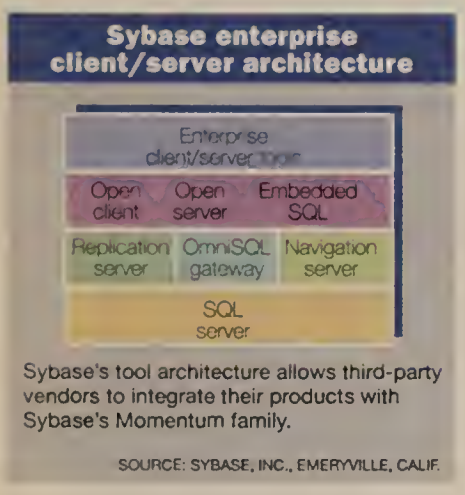
Rohde joined CCMI in 1990, when the company was acquired by the United Communications Group. He worked for United Communications' energy and banking publications and was twice awarded for journalistic excellence by the Newsletter Publishers Association.

Sybase unveils new development tools

BY PETER LISKER

Emeryville, Calif.

Sybase, Inc. made a bold foray into the market for client/server application development tools here last week with the unveiling of two products. The company also announced that its previously announced Gain Momentum multimedia information delivery system is now shipping.



Sybase's tool architecture allows third-party vendors to integrate their products with Sybase's Momentum family.

SOURCE: SYBASE, INC., EMERYVILLE, CALIF.

The new tools, Build Momentum and Enterprise Momentum, complete a development platform that Sybase says will be a significant advance for companies looking to ease the burden of developing client/server applications.

Build Momentum is a graphical, object-oriented tool for developing and deploying applications at the client level. It includes a migration path to upgrade existing Sybase APT Workbench applications into a graphical environment. Enterprise Momentum is an object-oriented, model-based development framework that works with the Sybase System 10 relational database management system where the models are stored.

Gain Momentum is currently available on the Motif platform, with support for Windows NT scheduled for first-quarter 1994. Build Momentum and Enterprise Momentum will be available on Windows, Windows NT, Macintosh and Motif systems.

"The Momentum series of products is the culmination of a two-year effort to alter the way people develop applications in the client/server world," said Robert Epstein, Sybase cofounder and executive vice president.

"We believe that by providing an architectural framework that is open and extensible, the customer will be able to craft applications ranging from the departmental level all the way up to enterprise applications," he said.

The announcement received strong support from third-party tool vendors, who apparently see sales opportunities in the new architecture.

"This validates our strategy in providing model-based front-end systems for Sybase and other database systems," said Anu Shukla, vice president of worldwide marketing for Uniface Corp., a leading tool vendor whose product Sybase resells.

While Gain Momentum and Build Momentum were an integral part of the announcment, interest was focused on Enterprise Momentum, the high-end component that is not scheduled for release until the fourth quarter of 1994.

Enterprise Momentum uses a new development process, Applications from Models, that lets customers generate and maintain applications directly from business models of the enterprise.

The models are graphical representations of business processes, data structures and user interfaces, all of which are stored in a repository. This repository and the models within it are meant to ensure that new applications are consistent across the enterprise.

The product appears to be highly developed in terms of its architecture and strategy yet is still undefined at the key level of the application program interface that will allow other tool vendors to connect their products to it.

Sybase gathered support from key tool vendors, including Bachman Information Systems, Inc., Interactive Development Environments, Inc. and LBMS, Inc., which all announced their intention to provide links to the Enterprise Momentum environment.

Sybase stressed that the Enterprise Momentum product will also benefit users of non-Sybase DBMSs through its OmniSQL gateway, which allows connection to rivals' databases. This is a critical factor for large enterprises that typically have a disparate mix of database systems that must be integrated to support enterprise applications.

Microsystems Software debuts group scheduler

CaLANdar 2.5 to feature new GUI, tools.

BY BOB BROWN

Framingham, Mass.

Microsystems Software, Inc. will announce later this month a new version of its group scheduling software featuring an improved graphical user interface (GUI) and new administrative tools.

CaLANdar 2.5 is a DOS and Windows application that enables users to schedule meetings and assign tasks across a network using the communications capabilities of popular electronic mail systems.

Microsystems, based here, focused much of the development for the new CaLANdar version on its Windows GUI, which presents the user with an electronic appointment book rather than the textual list of appointments it offered in the past, said Scott Benson, president of Microsystems.

"Previously, you didn't have a graphical sense of where you were" when looking at the application, he said.

The new interface can represent calendars by day, week and month, and lets users schedule appointments by dragging and dropping data and icons across calendar pages. Users can check the availability of other users and resources, such as conference rooms, by viewing calendars shaded in different colors to represent busy times. End users can also view their schedules over 12-month periods in a graphical manner.

The application can be used in conjunction with Banyan Systems, Inc.'s VINES Mail, Lotus Development Corp.'s cc:Mail, Microsoft Corp.'s Microsoft Mail and assorted Message Handling Service (MHS)-based products.

Perhaps most important to E-mail administrators and information systems managers are the new administrative features of CaLANdar 2.5.

The new version allows administrators to set parameters from Windows, Benson said. Previously, administration was limited to character-based DOS, he said.

The software also features a new tool dubbed the WANalyzer that can be used to monitor the status and performance of CaLANdar systems across a network.

A new feature called SuperVIEW enables authorized users to look at CaLANdar databases across a network to determine overall activity associated with a particular event. For example, this could be used to figure out how much time is being spent on a particular project.

CaLANdar 2.5 will ship later this month. A 50-user pack will cost $40 per user, while an upgrade from earlier CaLANdar software to the new version will cost $4 per user.

FUTURE PLANS

Benson said Microsystems, a $300 million firm with about 25 employees, has big plans for the future. It plans to roll out an Apple Computer, Inc. Macintosh version of its product by year end and a Unix Motif version next year. The company needs to support all of the major platforms to meet the needs of users with large nets, he said.

Microsystems also plans to upgrade its software so that it can use E-mail or local-area network directories rather than synchronizing its directory with other directories. Since most companies are already using an E-mail directory, LAN directory or both, Benson said he wants to avoid making users support yet another one.

✆Microsystems: (508) 626-8511.

Security

Continued from page 4

sentatives from Novell, Microsoft Corp., Open Software Foundation, Inc., Sun Microsystems, Inc. and suppliers of Kerberos encryption technology to an NSA workshop next week to help define the Common Criteria.

But users on the Computer Systems Security and Privacy Advisory Board were exasperated that the user community — already angry at being shut out of the government's decision on key-escrow encryption — was again being given the brush-off on a major government decision concerning security.

"I keep hearing the same thing — that it's just the first step," said Sandra Lambert, vice president of security at Citibank, N.A., a Privacy Advisory Board member. "Here we are again, and I'm hearing the same thing: 'we'll get the users in at some point.' You've got to involve the users up front."

The first draft of the guidelines is set for April. The U.S. government hopes to adopt it soon thereafter as the national framework for security in operating systems, databases and networking components.

NETWORK MODELS

Tool designs LANs, WANs

BY SKIP MacASKILL

Falls Church, Va.

Virginia Polytechnic Institute and State University and BDM Federal, Inc. have teamed up to develop a network modeling tool that will help users design efficient broadband networks.

The software-based application allows users to simulate various network designs and configurations, including nets based on services such as Asynchronous Transfer Mode (ATM) and frame relay. It also lets them analyze potential network performance.

"The product is geared to companies that want to implement large, complex networks," said Fred Ricci, program director of the electrical engineering department at Virginia Tech. "It could be used to try various configurations and answer a variety of implementation questions, such as how many switches are needed and how many LANs are required."

The tool grew out of joint development work conducted by the university and BDM, a professional services company based in McLean, Va., that primarily provides support to government agencies in specialized technical and engineering areas.

The model consists of three software modules: a setup piece, a simulation package and an analysis application. The setup software, which runs on a DOS-based personal computer, lets the user enter information about the net environment to be simulated.

The user can enter a range of configuration data, including traffic statistics and information about end connectivity, the type of local- and wide-area links in place and the type of wide-area network services needed. The software compiles that information into a series of call script files, which are then passed to the simulation package running on a VMS processor.

Results of the simulation are passed back to the PC platform, where the third module analyzes the information culled from the simulation and generates a variety of network statistics, including bit error rate performance, potential bottleneck connections, and the number of packets or cells sent, received and dropped.

The model can also handle simulation and analysis of wireless mobile environments and communications, providing line-of-sight measurements and terrain information for all of Europe, for example.

For a user considering the best way to link local-area networks over a wide area, for example, the model can run several simulations showing how the network performance would differ depending on the high-speed device or transport service used for those connections.

"It allows the user to make better informed purchasing decisions by letting them avoid buying unnecessary equipment or devices that will not be efficient in delivering the needed performance," Ricci said.

The model is available now from Virginia Tech and BDM. Pricing is determined on a user-by-user basis.

✆Virginia Tech: (703) 698-6025; BDM: (703) 848-5557.

CORRECTION

The price of San Diego-based Qualcomm, Inc.'s Eudora by Qualcomm electronic mail software was incorrectly listed in a story last week (Aug. 30, page 8). The product costs $50 per user.

Digital Equipment Corp. has not yet established pricing for Polycenter NetView, rather than Polycenter Framework as reported last week (Aug. 30, page 1).

The Compaq Ul
For Brighter Bright

Compaq UltraView Active Matrix Screen

Tired of everything looking dingy and gray? Embarrassed by dull whites and faded blacks? Try UltraView. The exclusive screen of the LTE Lite 4/25E. It's the only black and white active matrix VGA screen on the market. And the brightest, highest-contrast screen available. So it

traView Screen.
s And Whiter Whites.

Passive Matrix Monochrome Screen (screens not retouched)

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Kodak makes changes at imaging unit

BY BOB BROWN

Bedford, Mass.

Eastman Kodak Co. this week plans to announce major changes at its Imagery Software, Inc. subsidiary that stem from a corporatewide restructuring under way at the $20 billion photography and chemicals firm.

Kodak is redefining Imagery's mission to focus entirely on developing software for OEM partners, particularly Lotus Development Corp. and Novell, Inc. As a result, Imagery is putting on hold its plans to release FullView, a $99 desktop imaging product announced just a few weeks ago.

Kodak executives felt that Imagery was not organized properly to sell FullView as a retail product and that doing so would be expensive. Imagery will remain a wholly owned subsidiary of Kodak but will become part of Kodak's Equipment and Software Platform Center, a product development group.

Kodak has trimmed the Imagery staff — mostly in management and marketing positions — from 55 to about 40, eliminating redundant positions under the new organization chart. Among those who have left is Steve Conkling, Imagery's president.

With Kodak, based in Rochester, N.Y., reeling financially, its board of directors voted in July to replace Chief Executive Officer Kay Whitmore, largely because his turnaround plan was not aggressive enough. In examining "the entire business portfolio," Kodak officials decided to make the changes at Imagery, which was formed in 1991.

Jane Stanhope, director of image and work flow systems at International Data Corp./Avante Technologies, Inc., a Framingham, Mass., market research firm, said Imagery became a target of Kodak's cutbacks because the subsidiary was likely spending about $1 million per month. In addition, Imagery was missing its sales targets in the Notes market, which it and Lotus may have overestimated.

Imagery has partnered with Lotus to provide Lotus Notes: Document Imaging, a Notes companion product that lets end users scan, display and print images.

Imagery has provided Novell with the High Capacity Storage System (HCSS), a service bundled into NetWare 4.0 that enables users to tie multiple optical and other storage devices into the NetWare file system. HCSS will serve as the underlying service in NetWare 4.0 on which users can run future NetWare Loadable Modules (NLM) from Imagery for storage, image and document management.

Those optional NLMs will consist of the Mass Storage Subsystem, which will let users construct a storage management hierarchy; Document Management Service, which will provide an object-oriented view of documents; and Image Management Service, which will permit users to scan images into the NetWare server and will provide users with access to them.

"We'll really tighten those relationships with Lotus and Novell," as well as with other OEM partners and various Kodak units that have complementary technology and products, a Kodak spokesman said. He emphasized that Kodak is not "killing FullView," although related marketing partnerships with Reach Software Corp. and WordPerfect Corp. are indefinitely on hold.

SQL

Gupta announces CASE partnership agreements

BY PETER LISKER

San Francisco

Seeking to strengthen its position within the SQL marketplace, Gupta Corp. last week announced agreements under which leading CASE tool vendors will support its SQLWindows product.

GUPTA

SQLWindows is Gupta's personal computer-based, object-oriented tool designed to allow users to develop collaborative applications in a client/server environment. The announcement of support by computer-aided software engineering vendors promises to help customers that are anxious to speed application development under Windows.

The alliances, announced at the Gupta Developers Conference here, will result in products that allow developers to work with existing CASE tools from affiliated vendors. Gupta will maintain an open repository that can be used by CASE tool vendors as a way to link their products to the Gupta database system.

In announcing the agreements, Umang Gupta, the company's cofounder, president and chief executive officer, stressed that cooperation of CASE vendors is critical to Gupta's Tools for Integration (TIE) scheme, which defines the links available to software vendors for integrating SQLWindows into heterogeneous development environments.

The vendors supporting SQLWindows include Bachman Information Systems, Inc., Intersolv Inc., LBMS, Inc., Logic Works Inc., Popkin Software and Systems and Visible Systems Corp.

Gupta said the company will pursue alliances with other CASE vendors in order to give his company's customers the widest range of development tools.

"Our users view application development of SQL-based systems as one of their prime objectives in the corporate computing environment and are anxiously awaiting CASE technology at the PC level," Gupta said.

Gupta has been aggressive in staking out the Windows-based PC end of the SQL database arena and has more than 125,000 copies of software licensed throughout the world.

"We think Gupta is the technology leader in providing Windows-based PC SQL solutions and feel that the market is ripe for CASE development tools that ease the burden of developing client/server applications," said Bob Coven, president of InterAccess Corp., a Totowa, N.J., provider of consulting services for graphical client/server systems. "By aligning itself with some of the leading CASE vendors, Gupta is able to offer an extremely complete development environment."

Users grapple with latest VINES

BY CHRISTINE BURNS

Users of the latest release of Banyan, Inc.'s VINES network operating system are reporting problems with one of its key features, the StreetTalk III global directory service.

StreetTalk III was originally released in January as the major new component of VINES 5.50, but many users that shy away from first releases are getting their first look at the directory service in VINES 5.52(5), which came out in May.

Joseph Anshien, net administrator for Executive Resource Associates, an Arlington, Va.-based firm that manages the VINES network for the U.S. Agency for International Development (USAID), said his company is having difficulty updating the StreetTalk directory via dial-up links.

USAID has 147 VINES servers worldwide connected primarily via an X.25 network, with some connected via dial-up lines to servers in its main offices in the Washington, D.C. area.

Most of the servers are running VINES 4.11, but four machines in the Washington, D.C. area form a test bed for VINES 5.52(5).

Once a day, each server ships directory updates to a master repository running on a VINES 5.25(5) server in Washington, which, in turn, downloads an updated directory to all remote servers.

VINES 5.25(5)

Released: May 1993

Major enhancements: StreetTalk III and improved WAN connectivity.

User problems cited: Directory update failures over WANS.

Server crashing due to simultaneous password validations.

Number of patches to date: 47

Composite patch release due: 4Q

SOURCE: BANYAN SYSTEMS, INC., WESTBOROUGH, MASS. AND *NETWORK WORLD*

However, Anshien said the master repository will not accept updated directory data from the servers that communicate with it via dial-up lines.

"So my servers only have half of the updated directory information that's supposed to be there," Anshien said. That creates problems such as returned electronic mail messages due to inconsistencies between local and master directories, he said.

Since VINES 5.52(5) shipped, Banyan has issued 47 patches to fix problems or provide functionality not included in the original release, said Pam Campagna, product-line manager for VINES. Banyan will ship a composite patch in the fourth quarter that will include all past fixes.

Anshien has installed 24 of the 47 available patches, one of which was designed to address his directory problem, but to no avail.

David Meyer, a systems integration manager at the Washington, D.C.-based Nature Conservancy and a board member of the Association of Banyan Users International, has installed VINES 5.52(5) on two of his organization's 13 servers. Meyer, too, is only testing the waters of the new version before upgrading the entire net.

Meyer is also having a problem with the global directory service: Every time two users try to validate their passwords at the same time, the server crashes. He has installed eight of the patches issued by Banyan but was unaware of one that might address this problem. "We decided to stop our upgrade until all of our major problems have been ironed out," Meyer said.

Campagna refused to comment on either users' problems with StreetTalk III because she did not have firsthand knowledge of them. However, she noted that about one-third of the 47 patches were site-specific fixes requested by particular users.

Ingres Replicator promises data integrity

BY PETER LISKER

Alameda, Calif.

The ASK Group, Inc.'s Ingres Products Division next week will introduce the Ingres Replicator, a replication server that brings increased data integrity to transaction processing applications in a client/server environment.

Replicator will replicate database tables at user-defined intervals, an approach that differs from the dynamic two-phase commit method used in products from Ingres competitors Informix Software, Inc. and Oracle Corp. Rather, Ingres' Replicator is similar in architecture to Sybase's recently announced Replication Server, though Ingres' offering will allow any database to initiate replication, not just a single-source database.

"Replicator uses asynchronous replication to avoid the tremendous overhead that results from using a two-phase commit scheme for multiple sites such as Oracle uses," said Russ Donovan, director of product marketing at Alameda, Calif.-based Ingres. "In addition, our product will set new standards in usability and functionality."

With replication, database updates are transmitted at user-specified times that don't necessarily correspond to the time when the transaction takes place. It is simpler and less expensive to implement than two-phase commit schemes, which require all databases to be in sync at all times.

The Replicator will allow users with distributed databases to schedule and administer replication at defined intervals or at the time the transaction is complete. Lists that define intervals and detail which tables are to be replicated are maintained through the Replicator Monitor, software that runs on a nondedicated workstation linked to the Ingres database server.

The product will let users denote whether the source or target systems have priority in resolving conflicts from simultaneous updates, a feature that

See **Replication,** *page 54*

BRIEFS

Larse Corp. last week announced it has changed its name to Larscom, Inc. and has rolled out a new family of T-1 and T-3 access multiplexers.

The Orion family consists of four boxes supporting a variety of high-speed T-1 and fractional T-3 rates. The Orion 4000 is an 11-slot fractional T-3 multiplexer that also supports T-1 interfaces, while the Orion 1000 is a 10-slot T-1-only access mux.

The Orion 400 supports up to four ports or two T-1 interfaces. The Orion 200 supports two-port access to a single T-1 or fractional T-1 speeds.

The Orion Models 4000 and 1000 will be available in late 1994. The Orion 400 and 200 will be available before year end. Pricing was not available.

Larscom: (408) 986-8690.

Rabbit Software Corp. of Malvern, Pa., announced it has entered into preliminary talks to merge with Tangram Systems Corp. of Raleigh, N.C.

Both companies are majority owned by Safeguard Scientifics, Inc., in Wayne, Pa., which supports the merger.

If the transaction is consummated, a new company named Tangram Enterprise Solutions will be formed with headquarters in Raleigh. The new company would be worth an estimated $35 million.

Rabbit Software: (215) 647-0440.

ProTools has announced support for IBM's Communications Manager/2 and AnyNet/2 software, enabling its Network Analysis Series product to perform network analysis across interconnected Systems Network Architecture networks.

AnyNet/2 allows IBM's Advanced Program-to-Program Communications applications to work across Transmission Control Protocol/Internet Protocol networks, and Sockets applications to work across SNA nets. Communications Manager/2 provides SNA communications across local- and wide-area networks.

Support for these products enables ProTools to route Simple Network Management Protocol data over SNA networks, allowing network managers to retrieve LAN management data across SNA backbones.

ProTools products supporting SNA networks are priced from $1,550 to $10,795 and are available now.

ProTools: (503) 645-5400.

Proginet Corp. last week announced that it has installed IBM's VTAM Version 4 on its data communications service bureau mainframe, enabling users and software developers to test Advanced Peer-to-Peer Networking (APPN) or Advanced Program-to-Program Communications software packages in a live networking environment. VTAM Version 4 contains support for APPN and a variety of other performance enhancements for SNA users.

Proginet: (516) 228-6600.

IBM's Hancock facing division's future boldly

Seeks to continue Networking Systems' success.

Q&A

One of the few IBM success stories in the past few years has been its Networking Systems line of business. Led by Senior Vice President and General Manager Ellen Hancock, Networking Systems has had to move Big Blue away from a proprietary hierarchical communications scheme to an open multivendor networking strategy. While this shift has been painfully slow in some areas — such as network management — and remarkably swift in others — such as support for Asynchronous Transfer Mode (ATM) — the group has relied on Hancock as its driving force.

Network World *Senior Editor Michael Cooney recently spoke with Hancock about the challenges and issues facing her business unit in areas ranging from Open Systems Interconnection to Advanced Peer-to-Peer Networking (APPN).*

From an IBM point of view, what are the greatest challenges facing networking users today?

Certainly the focus on building client/server and distributed networks are two of the greatest challenges.

Customers are very interested in understanding what the new technologies are and how they will help them with their networks. We often get into discussions about frame relay, ATM, high bandwidth, multimedia and wireless because of the increasing number of options that users are running into.

STEVEN BOORNS

The interoperability or connection of multiple types of equipment from different vendors is something that has user interest and concern. Then the ability to manage all of those things is extremely important.

See Hancock, *page 14*

NET MANAGEMENT

Sun, HP could lose in union of IBM, DEC

BY JIM DUFFY

Although Digital Equipment Corp. is eating humble pie after agreeing to resell IBM's NetView/6000 management platform, analysts say the vendors that will feel the most heat from the IBM-DEC union are SunConnect and Hewlett-Packard Co.

Analysis

At INTEROP 93 August in San Francisco, IBM and DEC announced an arrangement to port IBM's NetView/6000 to DEC's Alpha hardware. DEC will resell the product, called Polycenter NetView, as its strategic network and systems management offering for the future and will jointly develop subsequent releases of it and NetView/6000 with IBM.

In return, DEC will limit its own management platform, Polycenter Framework, to its installed base of VAX and Ultrix customers. In a sense, the deal signals DEC's exit from the management platform business and entry into IBM's value-added reseller channel.

By adopting NetView/6000, which is based on HP's OpenView, DEC has thrown considerable weight behind the OpenView application program interfaces (API) as a de facto method for accessing a common management framework, or so HP claims. Such an endorsement further distances SunConnect and its SunNet Manager platform from the industrywide effort to define a common management framework and standard APIs, according to HP.

Analysts agree to an extent.

SunConnect is still a formidable player in the network and systems management framework arena, they noted. But SunConnect will now be hard-pressed to persuade software vendors to write applications to SunNet Manager, which is what makes any management platform attractive to end users.

"This doesn't strengthen Sun, obviously," said Charlie Robbins, director of communications research at Aberdeen Group, Inc., a consultancy in Boston.

"Sun's job is to get its own alliances in place. It needs to move more aggressively to do that. It's had the support of the early developers and the hardware folks. But they've lost the bigger picture of the universal API kind of stuff," Roberts added.

"Sun's job is to get its own alliances in place. It needs to move more aggressively to do that."

Igor Stenmark, program director for open management strategies at Gartner Group, Inc., a consultancy in Stamford, Conn., agrees that independent software vendors will consider their management platform options more carefully now that IBM and DEC have allied.

Although independent software vendors may shun SunNet Manager, they will still write agent software for

See Union, *page 10*

Telematics' pricing rundown

Product	Price	Availability
Programmable Communications Processor 6000	$29,000+	Now
Ethernet LANeXchange	$2,225	Sept. 30
High-performance 68040 upgrade	$2,500	Now
AToM Switch	$25,000+	Aug. 1994

SOURCE: TELEMATICS INTERNATIONAL, INC., FORT LAUDERDALE, FLA.
GRAPHIC BY TERRI MITCHELL

Telematics details frame relay and ATM products

BY MICHAEL COONEY

Fort Lauderdale, Fla.

Telematics International, Inc. last week introduced a new frame relay access product, detailed shipping dates for its first ATM switch and added a TCP/IP routing feature to its Access Communications Processor (ACP)-50 frame relay access device.

The new products will help users build large, high-speed multiprotocol networks and solidify the company's efforts to fashion a one-stop shop for customer premises and central office networking products.

The firm rolled out the Programmable Communications Processor (PCP) 6000, a Reduced Instruction Set Computing-based frame relay switch capable of pumping out 50,000 4,096-byte frame/sec. Designed primarily for network service providers, the PCP 6000 can support up to 64 T-1 lines or, with a Telematics low-speed expansion chassis, up to 480 64K bit/sec lower speed lines.

Previous PCP models supported up to 16 T-1 lines and had a throughput of about 2,000 frame/sec.

The new switch contains both data communications equipment and data terminal equipment interfaces. That makes it suitable for users' private frame relay nets and as the basis for scalable frame relay services from carriers.

See Telematics, *page 10*

OSF details DME pricing, further delivery delays

BY JIM DUFFY

The Open Software Foundation, Inc. (OSF) has detailed pricing for the Distributed Services component of its Distributed Management Environment (DME), software that manages specific functions in distributed environments.

OSF said it will not release the DME's Management Framework component until at least 1995, more than a year later than originally planned. The Management Framework provides the core technology, including a management request broker, that applications use to perform management tasks.

The DME Distributed Services component includes software distribution and license management, print management, event service, subsystem management and personal computer services. Event service collects and distributes data on significant network events, while subsystem management service keeps interdependent systems running and in synch.

Software distribution service manages the electronic dispersal of software updates, while license management keeps track of the number of software licenses a user has purchased. Printing service allows users to send print requests to any printer in a network, while PC services provide basic management services, such as agent functionality and access to license services, for memory-constrained MS-DOS PCs. Distributed Services are packaged together under a single source code fee for vendors.

Vendors then establish their own pricing for users. Source code distribution is available in two forms: a $250,000 full distribution license, allowing vendors to distribute the software to users, and a $25,000 limited distribution license for in-house development.

OSF's Distributed Management Environment Distributed Services

Source code

Full distribution license:	$250,000
Limited distribution license:	$25,000

Object code

Clients: $25 per copy for quantities less than 20,000; $500,000 per year for quantities of 20,001 or more.

Servers: $50-$400 per copy for individual components.

SOURCE: OPEN SOFTWARE FOUNDATION (OSF), INC., CAMBRIDGE, MASS.
GRAPHIC BY TERRI MITCHELL

Object, or executable, code pricing has two categories. For client devices, Distributed Services are packaged together and cost $25 per copy, or $500,000 per year for more than 20,000 clients. For servers, Distributed Services are priced separately and range from $50 to $400 per copy. Distributed Services are slated to be released in the fourth quarter, with the exception of print services, which is targeted for release in the second quarter of 1994.

OSF will not release the DME's Management Framework until the first half of 1995 because it is adding the Object Management Group's (OMG) Object Request Broker (ORB) to the framework and adding services to the Distributed Computing Environment, upon which DME depends.

The OMG ORB, like the DME's management request broker, allows applications to share messages and invoke the services of management objects in a network. The difference is OMG's ORB is a standard whereas DME's broker is not.

The framework was originally scheduled for a December 1993 release but integration snags forced OSF to gradually push the release date back. Previously, Peter Shaw, OSF director for DME, said the framework would be out by the end of this year.

DEC to ship enhanced TCP/IP for OpenVMS

Version 3.0 offers improved connectivity.

BY JIM DUFFY

Maynard, Mass.

Digital Equipment Corp. is expected this week to ship TCP/IP Services for OpenVMS AXP Version 3.0, an enhanced release of its Transmission Control Protocol/Internet Protocol software that will offer new standards-based connectivity options.

TCP/IP Services V.3.0, which had been expected (*NW*, May 31, page 13), runs on DEC's Alpha processors. It allows DEC VAX and Alpha machines to share data and applications with Unix systems via TCP/IP.

Among the enhancements included in Version 3.0 are PC-NFS and TN3270 support, improved performance and client/server licensing.

PC-NFS allows MS-DOS- and Windows-based personal computers to share files with TCP/IP Services 3.0 servers using Sun Microsystems, Inc.'s Network File System. NFS is usually used with Unix systems.

TCP/IP Services V.3.0 does not yet include NFS client support, which would enable Alpha systems configured as network clients to access files on Alpha and Unix servers, although that feature is expected to ship in November.

TN3270 support allows DEC users to access IBM 3270 host applications via Telnet terminal-emulation protocols.

To enhance its performance, TCP/IP Services V.3.0 reduces the amount of packet header processing and packet acknowledgement data. It also minimizes the probability of packet loss via new code that helps it avoid an imbalance in the speed of packet transmission versus reception.

Other enhancements include a Berkeley Internet Name Domain (BIND) server capability that allows Alpha systems to function as TCP/IP name servers. Version 2.0 of TCP/IP Services already supports BIND client capability.

Also, Telnet printing is available in Version 3.0, which allows Alpha systems to print jobs on local or remote TCP/IP printers. And Version 3.0 also includes a remote boot capability, enabling users to bring up TCP/IP systems from a remote location.

The client/server licensing option allows users to purchase Version 3.0 as a server license that includes all the new capabilities or as a client license, which does not include the NFS server, BIND server or remote boot capability.

TCP/IP Services for OpenVMS AXP V.3.0 is priced from $1,200 to $21,000.

Separately, DEC recently announced a package, called Reliable Broadcast Software (DECrbs), which enables businesses, such as financial information service providers, to broadcast information simultaneously to subscribers worldwide. DECrbs runs on DEC's Ultrix systems and works over TCP/IP networks.

DECrbs costs $3,000 to $35,000 and will be available in October.

✆DEC: (800) 344-4825.

Union

Continued from page 9

Sun workstations so those platforms can be managed by any console of the user's choosing, according to Stenmark.

Unlike other platform vendors, Sun has been reluctant to embrace Open Software Foundation, Inc.'s Distributed Management Environment. The IBM-DEC deal "just illustrates how much more they've become isolated in this industry," Stenmark said.

Sun scoffs at the notion that they are off on an island as a result of the IBM-DEC union.

"That's the traditional view again, the assumption that there'll be one winner," said Stan Baldwin, director of marketing at SunConnect, the Sun Microsystems, Inc. business unit that develops and markets SunNet Manager. "No one has had the best ideas. There'll be more than one platform out there, and Sun is going to be one of those. We have 35% to 40% of the market."

Even so, HP is claiming victory. Scott Safe, HP's OpenView program manager, said the IBM-DEC agreement makes OpenView's APIs pervasive throughput the industry and further consolidates vendors around OpenView as the de facto standard management platform.

"The loser is Sun, which continues to be put in a proprietary corner," Safe said.

Not so fast, said John McConnell, vice president of Infonetics Research, Inc. in Boulder, Colo. Even though NetView/6000 uses some OpenView technology, IBM has enhanced the platform to such an extent that an apple-to-apple comparison between NetView/6000 and OpenView is impossible.

For example, although the two products share the same core APIs, IBM has added APIs specific to functions it built into NetView/6000.

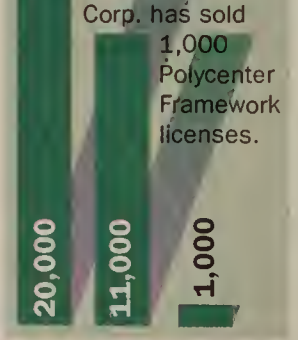
Bill Warner, IBM Networking Systems director of enterprise management, said only 30% of NetView/6000 is HP's OpenView and that the HP technology is a "declining part" of the IBM product.

"The company that's really going to have the pressure on them is HP," McConnell said.

"They've made a mistake all along of trying to position NetView/6000 as just a clone" of OpenView, he added.

Licensing

Hewlett-Packard Co. has issued more than 20,000 OpenView licenses, while Sun Microsystems, Inc. has sold 11,000 SunNet Manager licenses. Digital Equipment Corp. has sold 1,000 Polycenter Framework licenses.



HP has become complacent with the industry's perception —bolstered by the fact that IBM has licensed OpenView — that OpenView is the de facto standard for enterprise management, McConnell said. But while HP has been pounding its chest, IBM has been quietly developing NetView/6000, which is now a more elegant management product than OpenView in terms of functionality and usability, he said.

That is one of the main reasons DEC selected NetView/6000 instead of OpenView for its Polycenter NetView offering, McConnell and other industry observers noted.

And now IBM, with its OpenView "clone" and the help of DEC, is coming after HP.

"HP has had that [enterprise management] space uncontested for awhile," McConnell said. "The NetView guys have made it clear that's no longer the case. They're going to dominate that market if they can."

Telematics

Continued from page 9

The PCP 6000 supports Synchronous Data Link Control, asynchronous and X.25 traffic, enabling users to migrate various types of data onto a frame relay net and save money as compared to leased lines, said Dave Moxey, product manager for Telematics.

On the Asynchronous Transfer Mode front, the company said the ATM switches it announced in November 1992 would be available in August 1994. The larger switch, currently named the AToM 1E6, is designed as a backbone node, while the smaller model, dubbed Neutron, is a local ATM access box.

Exact specifications have not yet been set, but the AToM will have a total capacity of 2.5G bit/sec and at least 16 I/O slots that will support a variety of T-1, T-3 and Optical Carrier-3 (155M bit/sec) links. The system's throughput will be at least 1 million 53-byte cell/sec, according to Telematics.

Also last week, Telematics added Transmission Control Protocol/Internet Protocol routing support to its ACP-50 Frame Relay Assembler/Disassembler with the Ethernet LANeXchange (ELX). The ELX is a communications board and software that comes with new ACP-50s and can be added to existing boxes.

The ELX board supports one Ethernet port and two 384K bit/sec wide-area links. The new support will let users run TCP/IP data over frame relay or X.25 nets. The ACP-50 already supports Systems Network Architecture and asynchronous protocols. An ACP-50 is required on both ends of any wide-area link.

The PCP 6000 supports SDLC, asynchronous and X.25 traffic, saving users money compared to leased lines.

Telematics also announced a processor upgrade offer that lets customers with 68020 Telematics processors replace them with faster 68040-based processors for $2,500. The upgrade will improve performance threefold, the company said. Each 68040 processor replaces two 68020 processors. The offer is good through Dec. 10.

✆Telematics: (305) 772-3070.

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Hancock

Continued from page 9

Changes that are occurring in the communications arena are far more dramatic than the changes we're seeing in computer chips or direct-access storage devices.

Users want to know they are making the right technology choices. They want to understand where things are heading. They want to leave their options open to utilize the assets they have in their networks today and still expand them.

Over the years IBM has been a leader in the communications industry. What do you see as IBM's role these days?

I think we have leadership products in many different places. We still have leadership in the Token-Ring area.

I cite as leadership some of the work we've been doing with CICS. Something like 490 of our top 500 customers use CICS transaction monitor, and we are now porting it across different platforms. NetView and NetView/6000 take leadership roles in the net management arena.

If I have one frustration, it's that many times people don't think of us as a communications company, and yet we're a $5.3 billion line of business.

Has Louis Gerstner, IBM's new chief executive officer and chairman, put any new requirements on Networking Systems or changed your mission statement?

He has already attended several sessions [in an effort] to understand the scope of our product offerings.

In general, I think he is supportive of what we are doing. There have been no changes in our mission statement.

Has Networking Systems become more or less independent under Gerstner?

We are making more independent decisions and doing more independent work. We are asked to commit to the company on revenue, profits and cash in terms of assets. Once within that, we choose where our investments go.

We are working on building up our own image separately. We are doing more advertising, and I am very positive about our new dedicated sales force — over 500 representatives worldwide who are paid by NS to sell NS products exclusively.

There has been a lot of industry speculation that Networking Systems is shifting development dollars away from certain areas, such as OSI. Is that true?

There has been some confusion about OSI. We do not have as many people working on OSI support as we did in the past.

However, we do have a lot of OSI products available in the market. We did have a healthy investment in OSI and the products are in the market being sold.

We are still investing in OSI, so it's not like we've stabilized development. We have a team in Rome that is still working on extensions to OSI and developing areas where we do see growth, like X.400. We will continue to roll those products out.

As we go through our plans, we shift our investment. We are seeing large growth in LANs and other network-centric products so we are shifting development dollars to those areas.

Three out of four investment dollars are being spent on network-centric development, and one out of four is on the continuation of the host-centric work.

Shifting gears here, what do you need to do to get APPN rolling in the coming year?

We do have a window of opportunity now. The introduction of APPN in VTAM is, I believe, the major facilitator of APPN. There are over 20 vendors who have licensed APPN from us and we will work to increase the acceptance of APPN. Another key is to work to help users understand how well APPN can deal with the networks of the future, especially with ATM.

The APPN implementors workshop is also a healthy step.

I think we'll gain user acceptance now that so many APPN products — such as VTAM, Communications Manager and the AS/400 — support it. Those are the key drivers we will be focusing on.

What impact will Cisco Systems, Inc.'s decision to license APPN Network Node and pull the plug on its Advanced Peer-to-Peer Internetworking effort have on APPN?

We have never had any interest in that forum. We always indicated we wanted to work with vendors who wanted to develop APPN. We are pleased we came to an agreement with Cicso. We are pleased they will be using the APPN specifications. I think it's good for all of us.

Do you think the APPI forum helped the industry at all?

We would have done what they are taking credit for anyway.

I honestly think APPI was more of a distraction to the industry than a help. Our motivation is to have as many people in the industry support APPN as we can.

Compuware announces first client/server product

Offers network management of remote nodes.

BY CHRISTINE BURNS

Orlando, Fla.

Compuware Corp. jumped into the client/server marketplace last week with the release of a net management system for controlling OS/2-based nodes on remote local-area networks.

RemoteControl/2, released at the IBM Personal Software Products division's technical exchange here last week, is a suite of products that lets users configure OS/2-based devices, whether they are simply client workstations or servers running DB2/2.

Company officials said this development is the first of many which will reflect Compuware's shift in focus from mainframe database management to net management in the client/server marketplace.

"Our corporate strategy is to provide management solutions for client/server environments on a couple of different levels," said Frank Slootman, product manager for RemoteControl/2.

As part of that plan, the Farmington Hills, Mich., systems software vendor is acquiring EcoSystems Software, Inc., a Cupertino, Calif., producer of EcoSphere and EcoTools, Unix net management products.

SLOOTMAN

The EcoSystems venture will let the company offer net management in the open systems environment, while RemoteControl/2 gives Compuware entree into the client/server LAN arena, Slootman said.

The RemoteControl/2 software suite runs on OS/2 2.0 or 2.1, supports Network Basic I/O System and is comprised of four components.

An administrative piece resides on a management console in a central office and serves as the user interface, allowing manag-

See **Compuware**, *page 18*

ATM STRATEGY

Fibermux delivers on first phase of ATM rollout

BY SKIP MACASKILL

Chatsworth, Calif.

Delivering on the first phase of its ATMosphere Asynchronous Transfer Mode (ATM) strategy, Fibermux Corp. has introduced three modules for its intelligent hub that will allow users to build ATM backbones.

The modules for the company's Crossbow hub line take in Ethernet packets and convert them to ATM cells to be switched out over a high-speed backbone. Complementing these offerings is a new management application that allows customers to build virtual local-area networks and manage ATM backbones.

"In this phase, Crossbow hub users can migrate to ATM-based virtual networking and receive the benefits of switched network environments without sacrificing their existing infrastructure or installed base," said Mike Zeile, senior product manager at Fibermux.

The company rolled out the multipurpose Crossbow Backplane Extension Module (CBM), which will handle the Ethernet-to-ATM conversion duties as well as allow several Crossbow hubs to be connected via 100M bit/sec ATM links, creating a high-speed backbone.

The module features two sets of transmit/receive ports that allow one Crossbow hub to be connected to as many as two others. It also comes equipped with four 10Base-T ports, each of which can be connected to one of the hub's four Ethernet backplanes, providing dedicated 10M bit/sec pipes to high-performance workstations or servers.

The new Cross-Connect Module (XCM) is a board-level 16 input-by-16 output ATM matrix switch for the central hub in an ATM backbone net that handles all ATM cell switching and configuration management. It can provide ATM switching for as many as 16 Ethernet segments from up to 16 CBMs.

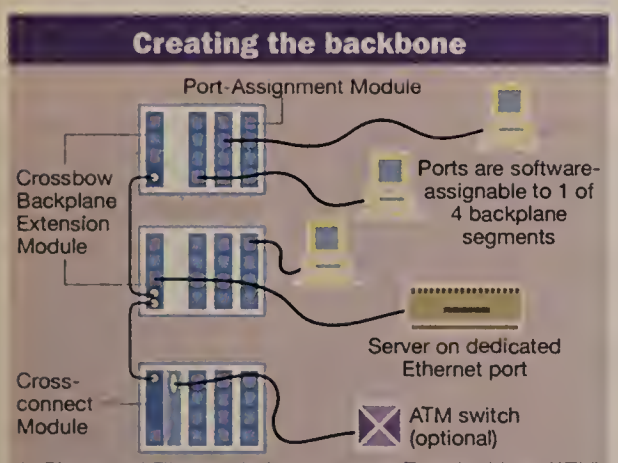
The interconnected CBMs feed traffic to the XCM, which switches the traffic to its destination via the matrix switch. Optionally, the Daughterboard Bus Interface is available for connection to a wide-area net. The first interface available will be a T-3 connection that can be used to link to another ATM switch or a wide-area routing device.

Fibermux also rolled out the Port-Assignment Module (PAM), which is a 12-port Ethernet module that offers users the ability to assign each port to one of the four Ethernet backplanes supported by the Crossbow hub.

This configuration switching capability

See **Fibermux**, *page 18*

Creating the backbone



In Phase 1 of Fibermux's Asynchronous Transfer Mode (ATM) strategy, users can employ backplane extension modules to link Crossbow hubs via 100M bit/sec ATM links to form ATM backbones.

SOURCE: FIBERMUX CORP., CHATSWORTH, CALIF.
GRAPHIC BY SUSAN SLATER

BRIEFS

Novell, Inc. announced last week that Roel Pieper has resigned from Novell's recently formed Unix Systems Group. Pieper was president and chief executive officer of Unix System Laboratories, Inc. before it was acquired by Novell earlier this year. Since that time, Pieper had been part of the executive team reporting to Kanwal Rekhi, the company's executive vice president and general manager of the Unix Systems Group. Pieper said he is leaving Novell to pursue other interests, although further information was not available.

Madge Networks, Inc. last week rolled out the Smart 16/4 Industry Standard Architecture Client Ringnode, a token-ring adapter for workstations in single-protocol environments. The card uses the Programmed I/O method for transferring data between the adapter and the host system, meaning applications on the file server can be downloaded to the workstation more quickly. Available now, the Client Ringnode costs $560.

Madge Networks: (408) 955-0700.

Wyse Technology, Inc. last week introduced its WyseNet line of terminal servers. Designed to connect serial devices to Ethernet networks, the servers work in both Unix and VAX environments. Available models include four- and eight-port devices that support the Transmission Control Protocol/Internet Protocol, as

See **Briefs**, *page 20*

NET RESULTS

By Mark Gibbs

Throw MoM from the network

At a recent network management conference, I heard a speaker talk enthusiastically about MoMs. He wasn't waxing lyrical about his mother, of course. He was saying that the way out of the quagmire of noninteroperable network management systems is using so-called Managers of Managers, or MoMs.

The idea of using a central system that provides a single view of the network by collecting data from other management systems is an idea that should have had a stake driven through its heart a long time ago.

Just think about your current network management problems. Trying to keep all of the network components flying even approximately in formation is difficult. The standards that those components rely on — DOS, Windows, NetWare, VINES, SNMP, NMS, NDS, StreetTalk and so on — keep being fixed and upgraded, and the management tools keep being fixed and upgraded along with them.

With each release, technical nirvana is expected. To quote John McConnell of Infonetics Research, Inc., "Paradise is only one upgrade away."

With a MoM, we're trying to integrate this ever-changing environment into a single, useful view. But we all know what happens when we get upgrades in systems that interoperate in even the most trivial of ways — they often stop working in some way.

After talking about MoMs, the speaker admitted one MoM won't cut it. He said getting one MoM for all management subsystems was unlikely. As a solution, he went totally nonlinear and spoke of the possibility of GOD — the General Operations Director. This messianic package would act as an integrator of the data from MoMs and produce a grand, unified view.

Unless you believe in the Sugarplum Fairy, this is not pragmatic thinking. If integrating data from diverse packages is complex, consider integrating data from diverse MoMs that is derived from diverse packages. If you have 10 management systems and five are integrated by one MoM and five by another and the MoMs integrated by a GOD, then you have a pretty complex system. Let's be optimistic and say that they all work together at some point in time, say the first day of the month.

Given the exuberant release and update schedules of many companies, it's likely that by the end of the month, at least one package will change. Assuming that the MoM vendor can issue an upgrade that works the following week and the GOD vendor a fix the week after, we've had a period where GOD was useless for half a month and MoM defunct for half of that time. If

See **MoM**, *page 20*

If managing your server eats up all

Introducing the new HP NetServer LM and LE.

More than just two new servers, we're introducing a profound improvement in the way you monitor and manage them.

Continuous Assistance.
We've put server management right where it belongs. At your fingertips. The HP NetServer Assistant software lets you easily monitor and manage your network servers from a single console–either locally or remotely. So your server stays up and running. Not you.

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These new HP NetServers lead the pack in reliability. RAID-based disk arrays on the LM provide advanced fault tolerance. And, thanks to our hot-swap capabilities, you can now replace an internal drive without bringing the server–or your network–down. The array will also automatically rebuild data on a failed drive. And for maximum protection, the LM even supports Error Correcting Code memory. In fact, the more critical your data, the more critical these servers become.

Investment Protection.
With technology changing faster than the weather, you'll be happy to know that HP's NetServers are designed to keep pace. And keep your investment protected. Both the LE and LM fit smoothly into multivendor environments. The LE is the ideal entry-level server. Upgradable to the future Intel OverDrive Pentium™ technology-based processor, it provides affordability, exceptional serviceability and future scalability.

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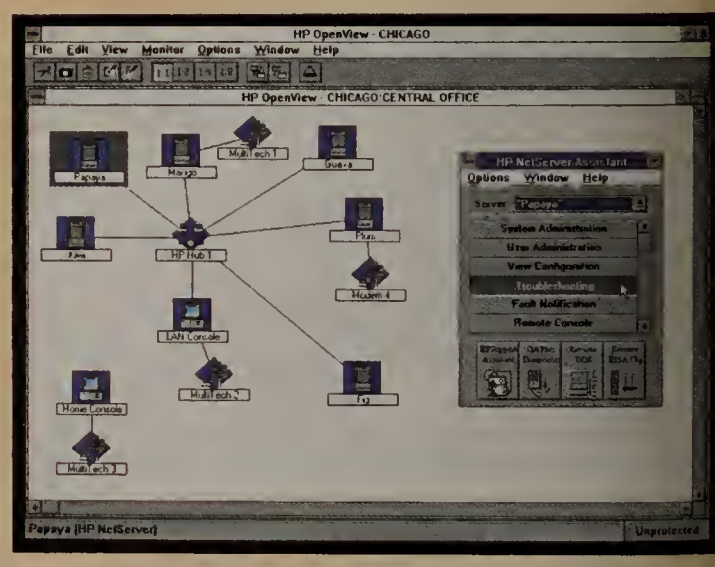

HP NetServer Assistant

HP NetServer LM

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- 16-MB standard RAM, 384-MB maximum memory, ECC memory support
- 128-KB and 256-KB external cache
- 9 mass storage shelves, 3.5″ floppy disk drive standard, maximum 8-GB internal storage
- 8 EISA-2 with Enhanced Master Burst bus-master I/O slots
- Integrated Fast SCSI-2, IDE and video controllers
- HP NetServer Assistant software included
- 3-year on-site, next-business-day limited warranty
- Tested and certified on major network operating systems

HP NetServer LE — $2,649**

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- 256-KB external cache
- 4 mass storage shelves, 3.5″ floppy disk drive standard, maximum 3-GB internal storage
- 5 EISA bus-master I/O slots
- Integrated Fast SCSI-2, IDE and video controllers
- HP NetServer Assistant software available as an option
- 3-year on-site, next-business-day limited warranty
- Tested and certified on major network operating systems

HP NetServer Assistant

Easy-to-use centralized management based on HP OpenView's leading network management environment allowing multiple servers in multiple sites to be managed from a single graphical map.

Problem identification and resolution tools including diagnostics, configuration information (whether the network operating system is up or down), disk capacity planning and technical information via a CD-ROM-based library.

Remote management capabilities allow administrators to use the same tools whether at their local console or a remote PC.

Open architecture facilitates adding specialized third-party or HP management utilities.

*U.S. list price for HP NetServer LM Model 530, including 486/33DX processor, 16-MB RAM and 535-MB SCSI hard drive.**U.S. list price for HP NetServer LE Model 240, including 486/33SX processor, 4-MB RAM and 240-MB IDE hard drive. Prices subject to change without notice. Pentium and the Intel Inside logo are U.S. trademarks of Intel Corporation. PPG686

HP NetServer LE

HEWLETT PACKARD

DCA intros next generation of remote LAN access product

BY CARYN GILLOOLY

San Francisco

Digital Communications Associates, Inc. recently introduced the next generation of its Remote LAN Node (RLN) software, which now includes token-ring and Simple Network Management Protocol support as well as a Windows client interface.

DCA's RLN remote local-area network connectivity product consists of both client and server software that lets a remote user log on to a LAN and navigate the network as if they were locally attached.

"RLN 2.0 is a whole new product, rewritten from the ground up on both the client and server side," said Bill Miller, vice president and general manager of the remote access division at DCA, based in Alpharetta, Ga.

The addition of SNMP is one of the product's primary upgrades. Both SNMP Management Information Base (MIB) I and II are supported, as are DCA's own MIB extensions. With SNMP, the RLN server can be managed, monitored and configured by SNMP-based management systems such as Hewlett-Packard Co.'s OpenView.

"One of our biggest sites has close to 100 RLN servers; it's important to be able to manage those servers centrally," Miller said.

To help manage distributed RLN servers, DCA included with RLN 2.0 its own Windows-based management console software. The console capabilities enable an RLN server to poll other servers for management information as would any SNMP-based management system. The application then displays the information in a graphical form that administrators can understand more easily.

RLN 2.0 lets users remotely connect to the corporate net through Windows, whereas previous versions required users to exit their Windows program to initiate the dial-in procedure.

DCA also added token-ring support in RLN 2.0, enabling users to directly attach RLN servers to token-ring nets. Previous versions only supported Ethernet.

Other new features include an application program interface to let administrators write programs that integrate RLN client functionality with end-user applications. Also included are domain access control capabilities, which let remote users dial into a particular domain of the corporate network as opposed to having to dial in to a particular server and then navigate to a different domain.

Future enhancements will include LAN-to-LAN routing capabilities as well as Apple Computer, Inc. Macintosh client support, although the company declined to provide further details on when these capabilities would be available.

DCA's remote connectivity family

Product	Type	Price	Availability
RLN 2.0 token ring	2-user version	$995	Now
	4-user version	$2,250	Now
	8-user version	$3,795	Now
	16-user version	$6,850	Now
RLN 2.0 Ethernet	2-user version	$795	Now
	4-user version	$2,250	Now
	8-user version	$3,795	Now
	16-user version	$6,850	Now
RLNserver (RLN 2.0 with hardware bundle)	4-port version	$3,845	Now
	8-port version	$5,390	Now
	16-port version	$8,445	Now

GRAPHIC BY SUSAN SLATER SOURCE: DCA, ALPHARETTA, GA.

And moving into somewhat of a new area, DCA said it will begin bundling its RLN software with hardware to give users the option of buying a complete plug-and-play product. The new offering will be called the RLNserver.

"Previously, the software version required the user to add cards and other hardware," Miller said. "Now we're giving the users the option to buy it all bundled with a CPU."

Miller also pointed out that RLNserver will let administrators rack-mount their systems, making it easier for customers that have a high requirement for remote connectivity.

✆DCA: (800) 348-3221.

Company bolsters line of LAN offerings with recovery devices

BY SKIP MACASKILL

Hackensack, N.J.

Hadax Electronics, Inc. has bolstered its RingTamer line of local-area network products with two additions that will help users troubleshoot several LANs from a single location as well as provide backup for critical network devices.

The first product is the LAN Access Unit (LAU), an eight-port device that allows users to connect two network analyzers to as many as eight locally attached LANs. Since the analyzers can operate simultaneously, two LANs can be tested at the same time, which allows network data to be compiled more quickly, according to David Foni, executive vice president at Hadax.

"The LAU eliminates the need to drag testing equipment from LAN to LAN or to have dedicated analyzers for each segment, thereby saving time, money and manpower resources," he said.

In addition to the eight LAN ports, the LAU, which comes in both token-ring and Ethernet versions, offers two access ports for the analyzers as well as two RS-232 serial ports that can be used to attach to other LAUs or an ASCII terminal or personal computer for control and management.

The analyzers can be switched among the connected LAN segments by either front-panel switches on the LAU or via software running on an ASCII terminal or PC supporting Hewlett-Packard Co. OpenView for Windows.

To manage the LAU under OpenView, users will need Hadax's Advanced Network Monitoring net management software. As many as 256 LAUs can be managed from a single OpenView PC.

Both versions of the LAU are available now and cost $1,395 each.

In conjunction with the LAU, Hadax announced plans to roll out its LAN Recovery Switch (LRS) next month. The LRS will provide disaster recovery for LAN internetworking devices by allowing as many as eight LANs to share one or two bridges, routers or gateways that the user has designated as hot standbys in the event of a disaster situation.

The eight-port device, for example, can be used to back up a bridge between two networks. The LRS connects to one of the networks and a spare bridge. If the primary bridge should fail, an alert will be sent to the net manager via whatever net management system is in place and he can then use the LRS to activate the spare bridge and reestablish the connection between the two networks.

While the LRS is currently a passive device that requires manual intervention, plans are under way to develop an automatic switch-over capability, according to Foni.

Like the LAU, the LRS offers eight network connections, two access ports for the backup devices and two RS-232 ports that can be used to attach to an ASCII terminal or PC. As many as 256 LRSs can be managed via OpenView for Windows.

Available next month, the token-ring and Ethernet versions of the LRS will cost $1,350 each.

✆Hadax: (201) 807-1155.

Fibermux

Continued from page 15

will ease the burden of moves, adds and changes for the net manager by allowing any port to be assigned to any Ethernet segment via software, Zeile said.

In a typical configuration, two Crossbow hubs housing a series of PAMs would be linked via two CBMs. Those hubs, in turn, would be connected to an XCM in a third hub.

If an Ethernet user in the first hub wanted to communicate with a user in the second hub, the packet would be converted to an ATM cell, sent to the XCM and then switched to the appropriate hub, where the cell would be reconverted to packet form and handed off to the intended address.

According to Zeile, by using all three new modules, users will be able to build ATM backbones that link Ethernet virtual networks via AirMan, a Simple Network Management Protocol-based application for its LightWatch net management system that allows net managers to build and manage virtual LANs.

"The virtual network capability will lower the cost of moves, adds and changes, provide instant network segmentation and bandwidth management as well as a great degree of security," Zeile said.

The three new modules and AirMan application will be available in the first half of 1994. Pricing has not yet been determined, but Zeile expects the cost to be about half of the current Ethernet switching price, resulting in an approximate cost of $300 per port.

In the second phase of the ATMosphere project, which is expected to be completed before the end of 1994, Fibermux will add a new ATM backplane to the Crossbow as well as a series of ATM I/O modules that will bring the technology down to the desktop.

According to Fibermux, it has an installed base of 6,000 to 10,000 Crossbow intelligent hubs.

While most of its hub rivals have been developing ATM switches or forging partnerships for ATM components, Fibermux has quietly provided the pieces to let users build ATM backbones today, according to Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "This is really a new vision of a LAN topology that doesn't rely on routers," he said. "It shows that the effect of ATM could be broader in a net topology than we originally thought."

While admitting that the first phase of Fibermux's strategy is among the best approaches out there, Nolle said the company needs to disclose pricing and future capabilities as well as provide users with its complete ATM story.

✆Fibermux: (818) 709-6000.

Compuware

Continued from page 15

ers to configure and control RemoteControl/2 components for remote file servers, database servers and OS/2 clients.

The combination of these components lets an administrator reboot remote machines; start and stop database servers; list, create and catalog databases; and transfer files to and from any node on the network.

A backup facility built into the server component supports multiple automatic backup generations, compression and encryption. A job scheduling function allows an administrator to set up off-hour, periodic or repeated execution of jobs on remote servers.

Another component is the Systems Network Architecture link, a gateway that bridges physically segregated LANs over an SNA backbone. The SNA link software sits on a database server on each LAN and converts NETBIOS to the Advanced Program-to-Program Communications protocol for transmission over an SNA backbone and then converts it back to NETBIOS at the other end.

The RemoteControl/2 suite will ship at the end of the month.

A starter kit, which includes one copy of each component, has a price of $5,000.

Additional servers start at $800, clients at $400, administrators at $5,000 and SNA links at $1,000. The price of each decreases when purchased in quantities greater than 10.

"The best thing about this product is its flexibility," said Greg Hohman, lead systems specialist at the The Travelers Corp. in Hartford, Conn., which has been a beta site for RemoteControl/2 since April. The Travelers is running the product on 10 DB2/2 database servers in offices in Georgia, California and Minnesota, all managed from the Hartford office.

Prior to installing the product, day-to-day management of the remote database servers was impossible. If a problem involving one of the servers arose, Hohman would send support staff to the remote site or try to solve the problem over the phone.

✆Compuware: (800)521-9353.

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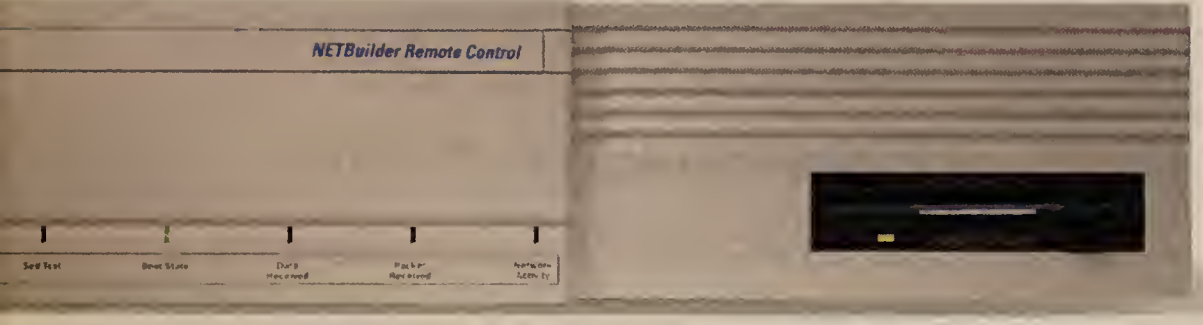

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Networks That Go the Distance™

Firm boosts NIC portfolio

BY SKIP MACASKILL

Austin, Texas

Thomas-Conrad Corp. has added new token-ring and Ethernet adapters to its network interface card (NIC) portfolio as well as new driver support for Microsoft Corp.'s Windows NT operating system.

Among the products is the TC4047 Token Ring Extended Industry Standard Architecture (EISA) Adapter, a 32-bit NIC specifically designed for high-performance servers and workstations.

The EISA adapter has an on-board Intel Corp. 80186 processor and uses frame-processing technology from Texas Instruments, Inc. in order to provide higher data throughput by moving much of the media access control-level data processing from software into hardware, freeing the host system's CPU for other tasks.

The software-configurable board — which supports 4M and 16M bit/sec nets and features a bus-mastering design, 33-MHz burst mode support and 128K bytes of random-access memory — can process more than 23,000 packet/sec, according to the company. It is available now for $725.

Thomas-Conrad also rolled out a 32-bit EISA card for Ethernet, the TC5047 Ethernet EISA Adapter. It features bus-mastering technology and autoconfiguring server drivers for Novell, Inc. NetWare 3.X and 4.X as well as workstation drivers for DOS-based machines.

The adapter is available in two versions. The TC5047-T provides direct connection to 10Base-T networks via an unshielded twisted-pair connection, while the TC5047-TIO offers 10Base-T and 10Base2 connectivity as well as an attachment unit interface port.

Scheduled to ship in mid-October, the TC5047 costs $275.

Rounding out the product introduction was new driver support for Windows NT. Products supporting Microsoft's new 32-bit operating system include Thomas-Conrad's TC4035, TC4045 and TC4046 token-ring adapters, as well as its family of 100M bit/sec TCNS ISA, EISA and Micro Channel Architecture adapters, which include the TC3042, TC3045, TC3046 and TC3047.

The Windows NT drivers are backward-compatible with all Thomas-Conrad network adapters and are available now from the company via the TCCFORUM on CompuServe, Thomas-Conrad's bulletin board system, or by contacting the company's technical support center.

✆Thomas-Conrad: (800) 332-8683.

Comments

If you have a comment on this or any other article, drop us a fax at (508) 820-3467 or call (800) 622-1108, Ext. 487.

MoM

Continued from page 15

another MoM was to change in the first half of the month, GOD could be useless for a lot longer.

This is the reality of network management in modern heterogeneous networks. It's not a case of moving goalposts. It is a case of the goalposts and the rules running amok.

Network management in heterogeneous systems is going to stay at least as complex as it already is for the foreseeable future. What will happen is that many of the things we worry about today, such as network transport management, will become trivial.

These types of things will be so well understood and streamlined that they will be an insignificant management load. Instead, new technology will provide features and facilities for you to curse and worry about.

Now the goalposts, rules and entire playing field are dancing a wild tango.

There is, unfortunately, no solution to this problem other than to accept that you will have multiple systems to manage.

The reality of network management is that it is complex and the technologies to be managed are evolving rapidly.

What we need are network services and systems that manage themselves more effectively and efficiently. Then we can concentrate on managing our networks for productivity rather than for control.

So if someone offers you a Manager of Managers as the solution to your network management headaches, by all means, try it, but don't be surprised if you have to throw MoM from the network.

➵Gibbs is a writer and consultant based in Ventura, Calif. He also consults with the National Computer Security Association at (800) 488-4595. He can be reached at (805) 647-2307, through CompuServe (75600, 1002), Novell's nHub (mgibbs@gyre) or on the Internet (mgibbs@rain.org).

BRIEFS

Continued from page 15

well as four- and eight-port versions that support both TCP/IP and the Local Area Transport protocol. Pricing ranges from $890 to $1,290, depending on configuration.

Wyse: (408) 473-1200.

Concord Communications, Inc. announced that its Trakker distributed net monitoring system will now run on top of Hewlett-Packard Co.'s net management platform. Previously, it only supported SunConnect's SunNet Manager. Concord also announced that it has joined the HP OpenView Solutions Partners Program to help market Trakker to HP users.

InterConnections, Inc. rolled out Version 3.0 of its Terminal Emulation Services (TES) package, allowing personal computer users on a Novell, Inc. NetWare local-area net to log on to VAX minicomputers and run VMS applications. New features in 3.0 include the ability to support up to 16 concurrent Windows sessions and support for Digital Equipment Corp.'s Local Area Transport protocol. Available next month, TES 3.0 costs $1,000 for a five-user license.

InterConnections: (800) 950-5773.

NetFRAME Systems, Inc. rolled out the FDDI I/O Processor, a Fiber Distributed Data Interface card for its superserver that supports both fiber and unshielded twisted-pair wiring. As many as four processors can be used in each superserver, allowing the device to support up to 2,000 end nodes.

While the dual counterrotating ring topology of FDDI protects the net from node failures or cable breaks, NetFRAME has increased the card's fault-tolerance capabilities with its Channel Start technology. Channel Start automatically detects I/O errors and resets the card if it fails due to transcient errors, data corruption or data loss.

The fiber version is available now, with the copper model following in November. Pricing starts at $7,995.

NetFRAME: (408) 321-7300.

HP unveils new net advisor software

BY JIM DUFFY

Fort Collins, Colo.

Hewlett-Packard Co. has unveiled a new release of its network advisor software that expands on its TCP/IP and Novell, Inc. NetWare troubleshooting capabilities.

HP also brought out a line of personal computer cards that help users transform PCs into management tools for troubleshooting local-area nets. In addition, HP announced that its NetMetrix network monitoring and analysis applications now run on Sun Microsystems, Inc.'s Solaris 2.X operating system.

HP said its NetMetrix net monitoring and analysis applications run on the Solaris 2.X operating system.

Release A.05 of HP's network advisor software runs on the vendor's Ethernet and token-ring segment monitors, including the new PC cards. It allows users to analyze NetWare and Transmission Control Protocol/Internet Protocol traffic in real time and filter frames to gather only the most significant network events. It also provides statistics on NetWare's and TCP/IP's upper layer protocols so users can set alarm and event thresholds based on that information.

Version A.05 allows users to customize sets of tests to solve specific network problems and decode a number of additional protocols, including Network File System, Simple Network Management Protocol Version 2, Routing Information Protocol and Internet Gateway Routing Protocol.

The PC cards, meanwhile, allow existing PCs to provide analysis, frame filtering and automated fault resolution of NetWare and TCP/IP traffic on Ethernet and token-ring LANs.

Version A.05 of HP's net advisor software is included with all of HP's segment monitors shipped after October. Users subscribing to HP's software update services will receive A.05 free of charge.

The PC cards are priced from $12,000 to $19,000 and are available now.

The NetMetrix applications for Solaris 2.X, which include five packages for monitoring and analyzing Ethernet, token-ring and Fiber Distributed Data Interface LANs, are priced from $995 to $3,995 and will be available in October.

The applications support the SNMP Remote Monitoring Management Information Base (MIB) and MIB extensions for vendor-specific LAN devices.

✆HP: (800) 452-4844.

Pacer to upgrade line of Mac-to-VMS software

BY CARYN GILLOOLY

La Jolla, Calif.

Pacer Software, Inc. next week is expected to introduce the next generation of its line of Macintosh-to-VMS file and print server software, which will offer integrated system management tools, on-line configuration and easier installation.

Version 9.0 of PacerShare, PacerPrint and PacerConnect provide different capabilities for Apple Computer, Inc. Macintosh users that want to connect to Digital Equipment Corp. VMS-based machines or nets.

For example, PacerShare is Pacer's implementation of Apple's AppleTalk Filing Protocol. It lets Macintosh users mount and use VMS directories as if they were local Mac directories. With the new PacerShare 9.0, users will be able to set their passwords through the Macintosh chooser rather than having to set them using VMS commands.

PacerPrint gives Macintosh users access to VMS print queues — letting them use VMS-based printers — and lets VMS users print on Macintosh printers. The new version now supports Apple's LaserWriter 8.0 driver, bringing the product up to speed with enhancements within the Macintosh environment.

PacerConnect is server software that provides terminal-emulation and file-transfer capabilities. Macintosh users can connect to a PacerConnect server on a VMS-based machine using any Macintosh Communications Toolbox, including Pacer's own PacerTerm. The new PacerConnect 9.0 will now let administrators perform timed system shutdowns, giving them a chance to notify users in advance.

Common to all of the new versions is an integrated install script that lets administrators install all of the software components required in each VMS-based machine with one command. In addition, a new management utility will now let administrators configure and manage all Pacer software through a single program.

PacerShare, PacerPrint and PacerConnect 9.0 are all available now. Current customers under maintanance agreements will receive the software at no charge.

For new customers, prices start at $3,750 for a 20-user PacerShare license or $5,000 for a 20-user bundle including PacerShare and PacerTerm. PacerConnect costs $2,000 for a single server, unlimited-user license. Pacer is based here.

✆Pacer: (619) 454-0565.

Rolm introduces two new 9751 PBX models

New server modules support enhanced features.

BY BOB WALLACE

Santa Clara, Calif.

Rolm last week introduced two models of its 9751 private branch exchange, along with hardware and software that give the switches advanced call routing and facsimile features, links to remote sites and more functional switch-to-host connections.

The 9751 Models 30 and 80 support 512 and 2,048 ports, respectively, and can be networked to support as many as 40,000 ports. Each runs Rolm's new 9006i switch software, which enables the switches to be linked to a maximum of 10 remote sites and supports private Integrated Services Digital Network nets.

"We've moved from a single main processor that supports all aspects of call processing to a distributed architecture where processors can be dedicated to specific functions," said Tony Tissot, group manager of systems marketing at Rolm. "New applications can be supported without affecting the rest of the switch."

With the existing 9751 models, adding applications means changing the PBX's switching matrix and sometimes the unit's main processor. With the Models 30 and 80, users just add application-specific servers that include an Intel Corp. processor, memory, storage, a hard drive and software. Tissot said the Intel processors offer varying power, beginning with the 80386 and 80486, and Rolm will use faster processors as they become available.

"New applications can be supported without affecting the rest of the switch."

Among the new server packages Rolm announced is the Call Center Management Server, which supports a feature called Flex-Routing. The feature uses automatic number identification, dialed number identification service and direct inward dial to route calls to specific agents or agent groups. Net managers can create as many as 4,000 separate routing paths to agents trained in handling particular callers.

A call center manager with a personal computer or terminal attached to the switch

See **Rolm**, *page25*

Rolm's new 9751 PBXs

Model 30	512 lines
Model 80	2,048 lines

Older 9751s

Model 10	80-600 lines
Models 40 and 50	50-3,750 lines
Model 70	Up to 20,000 lines

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: ROLM, SANTA CLARA, CALIF.

BT to install ATM switches for 1994 launch

BY BILL BURCH

London

While the U.S. has seen a recent flurry of Asynchronous Transfer Mode (ATM) announcements, ATM in the U.K. is proceeding at a slightly slower pace.

The U.K.'s dominant carrier, BT, plans to pursue both domestic and international ATM trials over the next few years, with the ultimate goal being to shift its packet services onto the ATM network and interconnect with other European ATM networks. Accomplishing these goals will take five years or more, according to Chris Fendick, BT's marketing manager for advanced network services.

BT's current data network research focuses on the SuperJANET network, a U.K. version of the Internet.

The net began as the Joint Academic Network (JANET), an X.25 network that linked universities and research organizations. Rechristened SuperJANET with the launch of high-speed services, the network now provides wide-area networking to academia, including LAN interconnection at 10M bit/sec.

SuperJANET will be the first tenant on an 18-month ATM trial network that BT plans to launch in February, Fendick said. The ATM network will connect 40 to 50 universities and research organizations for pilot applications including high-speed file transfers, multimedia experiments and high-resolution graphics.

For the network, BT will install a pair of AT&T Broadband Networking Switch-2000 ATM switches in September — one in London and one in northern England.

Those switches will be followed up with the installation of a service node, cross-connects and access nodes in February. The service node will function as the network's central processing platform; the cross-connects will provide interconnection for permanent virtual circuits; and the access nodes will provide peripheral entry points into the network.

The September switch installation will support metropolitan-area networks for frame relay and Switched Multimegabit Data Service (SMDS). When the remainder of the network gear is installed in February, BT will interconnect the networks for full ATM service.

The ATM network backbone will initially run at 34M bit/sec, although an upgrade to 155M bit/sec is planned. Access speeds will be the European E-1 standard of 2M bit/sec and the E-3 standard of 34M bit/sec.

Along with the ATM trial launch early next year, BT is also planning a fiber upgrade for its network. The company is gradually switching from the older plesiochronous digital hierarchy protocol to the more reliable synchronous digital hierarchy, the European equivalent of the Synchronous Optical Network standard in the U.S.

The changeover initially will target the pilot ATM network, but BT also plans to upgrade its backbone network as well as its transatlantic links.

Fendick said BT's initial goals for the new network are to gain a general understanding of ATM's service capabilities and to pin down user and network inter-

See **BT**, *page25*

BRIEFS

Combinet, a firm that makes equipment for Integrated Services Digital Network nets, has announced a dial-up electronic bulletin board, which contains ISDN deployment information provided by Bell Communications Research.

Users with a 2,400 bit/sec modem can receive ISDN availability, pricing and installation data via the free service by calling (408) 733-4312.

Combinet: (408) 522-9020.

At the recent INTEROP 93 August conference in San Francisco, a **WilTel** official said revenue from the carrier's WilPak frame relay service has not covered the expense of the equipment and the support needed to sell the service since it was first offered 20 months ago.

AT&T has announced that MetLife, a Tariff 12 customer, has awarded the carrier contracts totaling roughly $115 million for voice and data services. MetLife is midway through a five-year Tariff 12 deal — which will be extended by one year — and has signed a separate four-year contract for additional AT&T voice services, including 800 services.

Sprint Corp. has announced an agreement whereby it will resell Sync Research Corp.'s Systems Network Architecture conversion products and frame relay packet assembler/dissassemblers, which enable firms to support SNA over Sprint's frame relay service. Sync will provide its SNA Network Access Controller, which brings SNA traffic onto token-ring and Ethernet local-area nets and supports SNA over frame relay and X.25 networks.

ATM

PacBell to offer Bay Area ATM service and test bed

BY ELLEN MESSMER

San Francisco

By the end of this year, Pacific Bell will bring an Asynchronous Transfer Mode (ATM) metropolitan network online in the San Francisco Bay area to support both a commercial service and an experimental network.

Pacific Bell will provide a commercial T-3 ATM service along with a testbed network, dubbed the Bay Area Gigabit Network (BAGNet), over which user organizations will experiment with ATM services at speeds ranging from T-3 to 622M bit/sec.

"We are providing both a research and a service network," said Yuet Lee, executive director of broadband network services at Pacific Bell. "I will create two virtual nets — one for BAGNet, and one for Hughes [Aircraft Co.] and other early adopters."

Both nets will be supported by two Newbridge Networks, Inc. 31650 ATM switches in Pacific Bell central offices. ATM services will initially be limited to permanent virtual circuits, which require users to notify the service provider to reconfigure them.

But the standard for switched virtual circuits is nearly complete, and equipment vendors are expected to soon start implementing this much-needed flexibility in their ATM switches.

Pacific Bell already offers ATM on a customer-specific basis but plans to file its first general ATM tariffs with the California regulatory commission before the year is over. Hughes Aircraft will use Pacific Bell's local ATM net to access Sprint Corp.'s ATM long-distance service (*NW*, Aug. 30, page 1).

But another category of users, which four years ago conceived the idea of the BAGNet gigabit test

See **PacBell**, *page 24*

BAGNet gears up

Through the Bay Area Gigabit Network (BAGNet) test bed, PacBel and 13 user organizations intend to:

- Test Asynchronous Transfer Mode (ATM) switches for interoperability at speeds between T-3 and 622M bit/sec.
- Connect to other carriers' ATM services.
- Test signalling and encapsulation of non-ATM protocols in ATM.
- Conduct conversions of High Performance Parallel Interface and fiber channel interfaces to ATM.
- Perform distributed interactive videoconferences that include simultaneous data transfers.
- Use ATM to access mass-storage multimedia archives.
- Conduct medical imaging over ATM.
- Test multicasting and network management across different vendors' ATM networks as standards evolve.
- Test public-key authentication for network security.

GRAPHIC BY SUSAN J CHAMPENY SOURCE *NETWORK WORLD*

THE BIGGER PART OF OUR STRATEGY IS TO MAKE SURE ALL OUR PRODUCTS DON'T JUST WORK ALONE. THEY ALL WORK TOGETHER WITH YOUR EXISTING NETWORK TO CREATE AN INTEGRATED SOLUTION. AND WHEN THEY DO, THERE'S NO NETWORK THAT WORKS BETTER. FIND OUT HOW WE CAN PUT IT ALL TOGETHER FOR YOU. CALL 1-800-426-1212 EXT. 550.

MOTOROLA
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Bell Atlantic service will prod carriers for long-haul SMDS

BY BILL BURCH

Washington, D.C.

After 10 months of offering its own intra-local access and transport area SMDS, Bell Atlantic Corp. is taking steps that it hopes will prompt long-haul carriers to offer the service on an interexchange basis.

Although MCI Communications Corp. has said it plans to offer a Switched Multimegabit Data Service offering, no long-haul carrier currently provides it. Sprint Corp. has no plans to offer such a service; AT&T will trial SMDS in the first half of next year.

Bell Atlantic is hoping to prod them into action via a tariff that it has filed with the Federal Communications Commission for a service that provides access to long-distance SMDS nets, said Sue Mohnar, one of Bell Atlantic's fast packet product managers.

The Bell Atlantic service will premiere Oct. 1 with access speeds ranging from 1.17M to 34M bit/sec. Users will be able to monitor the service from any Simple Network Management Protocol-based management system.

Per-port pricing will feature flat monthly fees based on access speed, plus a monthly charge for the transport link from the customer premises to a long-distance carrier's point of presence. For a T-1 connection, transport charges run $216 per month for month-to-month contract. Users willing to sign up for five years pay $165 per month.

Bell Atlantic may be going out on a limb by offering a long-distance access service without a long-distance carrier to connect to, but Peter Bernstein, a senior analyst with Probe Research, Inc. in Cedar Knolls, N.J., applauds the company's initiative. "All ideas about all services deserve to be tested in the marketplace," he said. "Somebody has to make the first move, and Bell Atlantic is busy being aggressive."

Along with the new service introduction, Bell Atlantic is considering changes to its current intra-LATA SMDS offering that will affect the service's 35 to 40 customers.

Bell Atlantic's SMDS access service

Long-distance access per-port charges:

Rate (M bit/sec)	Monthly charge	Nonrecurring charge
1.17	$250	$260
4	900	300
10	1,000	300
16	1,000	300
25	1,200	300
34	1,300	300

SMDS = Switched Multimegabit Data Service

GRAPHIC BY TERRI MITCHELL SOURCE: BELL ATLANTIC CORP., PHILADELPHIA

In October, the carrier plans to build on the local service's 1.17M bit/sec access speed by adding in 4M, 10M, 16M, 25M and 34M bit/sec access. SNMP support is scheduled for early September.

In addition, the carrier wants to expand pricing on the local service from a flat monthly fee to include length-of-contract and volume discounts. Bell Atlantic has not filed for the changes with state regulators yet, and a company spokeswoman cautioned that plans remain tentative on new pricing and speeds.

PacBell

Continued from page 21

bed, will link their in-house ATM switches over Pacific Bell's ATM network to support applications that include access to databases and mass storage systems (see chart, page 21).

Among the 13 organizations that will participate in the BAGNet experiments are Digital Equipment Corp., Hewlett-Packard Co., Lawrence Livermore National Laboratory, Stanford University, Sandia National Laboratories, Sun Microsystems, Inc. and Tandem Computers, Inc.

To further the ideal of widespread computer access envisioned by the Clinton administration's so-called National Information Infrastructure, databases must be easily accessible over ATM switches, said Richard Watson, project manager for high-performance management and storage at Lawrence Livermore.

"Today, we can connect at 59.85M bit/sec into Cray [Research, Inc.] computers," Watson said. "But to make data available to hundreds of thousands of participants, we will have to scale this architecture to gigabits per second."

Lawrence Livermore intends to interconnect with the University of California at Berkeley and NASA's Ames Research Center over Pacific Bell's ATM network to test what Watson called "distributed mass storage."

BAGNet will also act as a proving ground for ATM switch interoperability. "It's already apparent that vendors are going to have to work together on the standards so people can interconnect their switches," said Carlos Cordero, a technician with Stanford's center for telecommunications, which is using an Adaptive Corp. switch in the experiment.

Geoffrey Baehr, chief technical officer at Sun's SunConnect business unit, which plans to join the BAGNet project, said his company has six ATM switches on-site — four from SynOptics Communications, Inc., one from Adaptive and one prototype research switch.

Sun, which has been running digital video between the ATM switches for 18 months, encountered interoperability problems, which were resolved when Sun notified vendors of the problems.

Within two weeks, Pacific Bell plans to issue a solicitation to accept proposals for application development projects to be funded under a program it is sponsoring called the California Research and Education Network (CALREN).

BAGNet is expected to apply for CALREN funding. But it will not be known how extensively Pacific Bell will underwrite ATM net services until the review of CALREN proposals is complete, which is expected by year end.

Pacific Bell's Lee said Los Angeles will likely be next in line for ATM.

BT

Continued from page 21

connection issues.

Ultimately, BT wants to shift its high-speed services to the new network. BT has run its global frame relay traffic for the U.K. and 15 other countries on a series of StrataCom, Inc. IPX switches. But once it has worked out the details, the carrier plans to shift frame relay traffic over to its ATM network, a move that should be transparent to users.

As for SMDS, BT finished a one-year technical trial of the service in June and plans to go on to offer a nationwide service supported by Siemens AG switches. Once the ATM network is in place, the SMDS net will be eclipsed since the carrier plans to promptly move SMDS traffic onto the ATM network, Fendick said.

BT will then turn the Siemens switches into access switches. Overall, Fendick said he expects deployment of the ATM network to take three years and the full services launch to take five years.

Looking beyond the U.K.'s own shores, BT agreed last November to take part in a pan-European ATM pilot network. BT will install a pair of Alcatel N.V. ATM switches for the international trial, which is scheduled to begin in mid-1994 and run for two years.

When BT first agreed to join the international network, plans called for it to interconnect with four service providers on the continent. But that number has expanded to a total of 17 operators covering most of Europe.

BT may also need to add staff to keep up with its European partners, as some of its allies appear further along with their ATM networks. In particular, France Telecom has said it will have a commercial ATM service in the second half of next year.

Rolm

Continued from page 21

can see real-time color displays of agent status, queue status and service-level information. Historical data can be stored for as many as 40 days in the switch's Informix Software, Inc. database.

Another new server, the RolmFax package, lets facsimiles be sent to an end user's telephone number and stored in the switch.

Text:Body¤After seeing the message-waiting lamp light up, end users can call into the switch, enter a password and have the fax printed locally, forwarded to another party or broadcast to multiple users.

TISSOT

The new 9751 models support more functional links to computers for call-processing applications that require customer information stored on host computers. The Model 30 and 80 can operate with six bidirectional links, while the older models only support a single, unidirectional link.

Rolm also introduced the new Remote Communications Module (RCM), which essentially functions as a low-end PBX that lets users tie remote locations as far as 3,000 miles away to a central site via a T-1 line.

The RCM, which only works with the two new 9751 models, supports a maximum of 128 RolmPhones.

Each Model 30 supports four RCMs, while each Model 80 supports 12.

According to Tissot, the offering will be used by companies with satellite sites, such as remote campuses, or by those that want to set up small or mid-size sites located outside congested cities.

The Model 30 and 80 also support CorNet, Rolm's ISDN-like private networking scheme that enables multiple switches to support basic capabilities such as calling name and number identification.

This allows users on a multisite network to use a single resource, for example, a Phonemail system.

For users of older 9751 switches, Rolm announced 9006m, which is software that enables the 9751 Model 10, 40, 50 and 70 to support CorNet for private ISDN networks.

Rolm also announced its first series of ISDN Basic Rate Interface (BRI) telephones for the 9751.

The ISDN BRI phones comply with National ISDN 1, a standard that delineates customer premises equipment to central office and interoffice switch connections.

The Models 30 and 80 are available now and cost about $650 per line.

The ISDN BRI phones will be available later this year for $650 each.

Help desk

Continued from page 2

traditionally been divided along platform lines. That is, one team supports the mainframe, another supports the AS/400 and yet another supports the LAN. In today's corporate environment, however, there is a need for interconnectivity among all of the diverse computing platforms. The interface areas cause gaps and overlaps in responsibilities.

In general, technical support people handle software installations, configuration, maintenance, upgrades and application troubleshooting. Telecom specialists handle the infrastructure, wiring, bugs, bridges and routers, and wide-area connectivity.

The demarcation of responsibilities depends on the size of the entire information systems support structure. If the whole organization is not too large (less than 100 people), we recommend placing the technical support groups and the telecommunications experts under one manager. This should help reduce the points of contention among the groups. If the entire support structure is very large (100 or more people), the telecommunications department should stand on its own. In this case, we recommend an oversight board that controls the direction of interconnectivity and communications.

We like to see firms form interdisciplinary teams to face the task of bridging disparate systems. These teams plan for the long range in terms of how systems will communicate, cooperate and share responsibilities. Team members should include technical support personnel as well as telecommunications specialists.

In contrast, the day-to-day communications tasks — support, acquisition, installation and such — should belong to your telecommunications group, whether the communication is within a single system or among different systems.

by David Rohde

Virtual net users feel brunt of price hikes

If you've ever tried to compare pricing and features for the major carriers' virtual network offerings, you may have found it rough going. If so, I have some good news and some bad news.

The good news is that MCI Communications Corp. three months ago changed its virtual network pricing scheme to make it more comparable to the ones used by AT&T and Sprint Corp. The bad news is that, in doing so, MCI raised its rates and then raised them again in the wave of long-distance price hikes touched off by AT&T last month.

In fact, widely overlooked in the recent upward turn in long-distance rates is the fact that virtual network users are being hit particularly hard.

Virtual network pricing is based on the idea that calls either originating or terminating on the network should cost less than calls made off the network. For example, Sprint's Virtual Private Network (VPN) has four rate schedules: on-net to on-net, on-net to off-net, off-net to on-net and off-net to off-net.

AT&T's Software-Defined Network (SDN) has three basic schedules since it places on-net to off-net and off-net to on-net calls on the same table. There is a fourth AT&T schedule for LATA-Pair Pricing — comparable to rates for point-to-point private lines — but it's only appropriate for users with a lot of traffic between two specific local access and transport areas.

MCI's old pricing method for its Vnet service required a little arithmetic on the user's part. MCI published the cost of transporting calls across its backbone network, the cost of terminating those calls off the network and the cost of access to Vnet. To come up with per-minute rates, the user had to add together the appropriate charges.

On June 1, MCI changed its tune and went with direct rate tables based on how each call originated and terminated. The net result, though, was an increase in Vnet rates.

MCI changed its tune and went with direct tables based on how each call originated and terminated.

Take the example of a 20-minute, 250-mile call. For origination and termination off the Vnet network, the cost under the old pricing method came to $3.74 after adding all three charges — access, transport and termination. On the new, "simplified" rate table, the cost came to $3.82. Then, on Aug. 6, the cost of this same call zoomed to $4.16 — an additional 8.9% increase.

This same call using AT&T cost $3.96 early this year. In the spring, the price rose to $4.04, and on Aug. 1, as part of the heralded 3.9% across-the-board rate hike, the price went up to $4.20. So not only have the pricing methods of the two carriers converged, but their prices have, too.

The on-net to on-net prices for both carriers, typically representing calls between two corporate locations, are much lower.

AT&T now charges $1.86 for a 20-minute, 250-mile call, while MCI charges $1.84, exclusive of volume discounts. MCI's charge represents an increase of about 3.4% for on-net to on-net prices. The actual cost to the end user is somewhat higher since these calls require dedicated access to the carrier's point of presence (POP).

Sprint's VPN charges are based on NPA-to-NPA rate bands instead of mileage bands. When the 250-mile example falls within Sprint's Rate Band 1, VPN works out to 20 to 25 cents less expensive than AT&T and MCI services for both on-net to on-net and off-net to off-net calls lasting 20 minutes.

Interestingly, though, the prices of calls where one user is on the network and the other is off are very close for all three carriers.

Of course, there are other factors to consider in choosing a virtual net provider, such as the availability of service from carrier POPs. It's probably no problem to find a carrier POP with virtual network service near your organization's headquarters, but how likely are you to find POPs offering virtual net service near your branches or outlying locations? Some users have chosen AT&T's SDN because of its wide availability at AT&T POPs.

David Rohde is associate publisher of the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 292.

Magic miniprofile

Based:	Parent company, Magic Software Enterprises, Ltd., in Israel. Magic Software Enterprises, Inc., the U.S. subsidiary, is in Irvine, Calif.
Founded:	1983
1992 revenue:	Over $10 million
Primary business:	Application development software
Sampling of customers:	Dunkin' Donuts, Inc., Hasbro, Inc. and Keyport Life Insurance Co.
Competitors:	Gupta Corp. and Powersoft Corp.
Sales channels:	Direct and value-added resellers, including systems integrators

GRAPHIC BY SUSAN J. CHAMPENY

Magic Software adds SQL database support

BY BOB BROWN

Irvine, Calif.

Magic Software Enterprises, Inc. this week will announce a new version of its application development software that features support for SQL databases and collaborative development.

Magic 5.5, which also supports development of transaction processing applications and two-phase commit, is designed to help users migrate to client/server computing across enterprise nets. The software features a rapid application development methodology based on filling in database tables with information about data, event control and other application components rather than developing code.

According to David Wegman, chief operating officer for Magic, the company is adding support for SQL databases and client/server application development in such a way that users will be able to migrate to client/server computing at their own pace.

Magic 5.5 features SQL support designed to satisfy both developers that do and do not know SQL, said Bruce Lomasky, software evangelist at Magic.

For SQL newcomers and those that do not want to go to the trouble of building SQL statements, Magic 5.5 applications can be written to SQL databases without writing even a line of SQL code. Gateways to various SQL databases handle the translation of Magic programs into SQL so that requests can be made against SQL databases. Magic 5.5 can also support developers that prefer to do their own SQL programming.

Developers can build SQL applications with Magic 5.5 to access databases from Digital Equipment Corp., Oracle Corp. and Sybase, Inc. using MagicGate database gateways. The company promises to offer one for Informix Software, Inc. databases, as well. Previously, Magic supported desktop and nonrelational databases, such as Btrieve, ISAM and Xbase databases.

The collaborative development capability will enable multiple developers to work on the same application, checking information in and out of the same repository simultaneously, Wegman said.

Magic 5.5 is available now, with pricing varying by platform. Licenses for multiuser DOS development begin at $2,000. The MagicGate gateways are also available now, and their pricing also varies by platform.

✆Magic: (714) 250-1718.

Lotus executive details Notes' work flow strategy

Pitches Notes as platform for third-party products.

Q&A

Most people consider Lotus Development Corp.'s Notes to be the premier groupware product. But what will it take for users to consider Notes the premier platform for work flow applications?

This is the central question posed by Network World *Senior Editor Wayne Eckerson to Lotus' point man on work flow development, Alan Rodgers.*

The work flow market is heating up. How well positioned is Notes to become a leader in this competitive arena?

Obviously no one product can satisfy all work flow requirements. Different tools are needed to support different business processes.

A tool that excels at routing expense reports won't succeed in supporting the work flow needs of heavily structured claims processing environments or ad hoc teams of white-collar professionals.

There are many vendors that already provide excellent products in each of these areas.

We see Notes as the socket into which users can plug all these different work flow tools. In essence, Notes will become a de facto middleware layer for work flow solutions.

JOHN THOMPSON

What makes Notes suitable as a universal work flow platform?

First, few groupware tools today work across as many platforms and network protocols as Notes does. This enables it to dissolve barriers between departmental islands of computing. It also has

See Notes, *page 31*

DIRECTORIES

Users seeking direction on directory services

BY BOB BROWN

Integrating multiple electronic mail, local-area network and other directories is a major headache for users looking to centralize management tasks but represents a huge opportunity for vendors, according to a new study.

The need for directory interoperability and synchronization is on the rise, thanks to the growing use of both E-mail systems and LANs, both of which often feature their own directory services. But interoperability isn't in sight. Even X.500 has yet to receive widespread support.

These are the findings of a survey by Tansy Associates, a market research firm in San Jose, Calif., of information system managers and E-mail administrators at 48 companies.

According to Tansy, 18% of the respondents have already implemented general directory services designed to let users centrally administer everything from E-mail to LAN addresses. But another 54% said they are planning to do so in the next two years.

This presents a huge opportunity to vendors such as Banyan Systems, Inc., Retix and SoftSwitch, Inc., that have already established themselves in the directory services market, according to the study. Newcomers, such as Angeli Systems Corp., could also prosper.

General directory services will need to support the directories tied to specific E-mail systems and LANs. Of the respondents, 82% said they have deployed or will deploy the directory components of their E-mail systems, while 64% said the same thing about the directories of their net operating systems.

Given that the typical user surveyed has implemented or plans to implement both E-mail and LAN directories, the directory services situation is growing more complex.

"Rather than narrowing the number of directory service systems that will be implemented, the number is actually likely to expand — and few of them are

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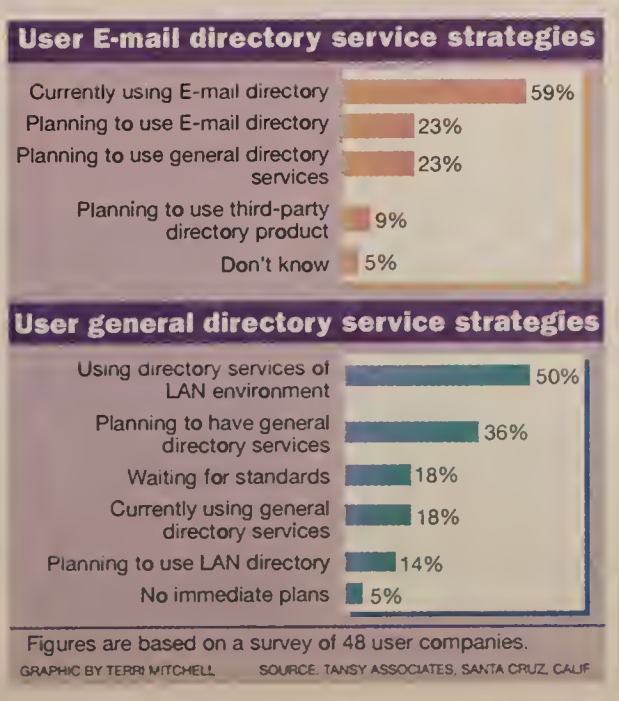

BRIEFS

Pacer Software, Inc. next week will ship Release 9.0 of its family of products that allow Apple Computer, Inc. Macintoshes to access file-and-print servers running on Digital Equipment Corp. VMS processors.

The new versions of PacerShare, PacerPrint, PacerConnect and PacerLink have upgraded system management tools, support for VMS Version 6.0, simplified installation and dynamic start-up and shutdown, among other things. Prices start at $3,750 for a 20-user PacerShare license.

Pacer Software: (508) 898-3300.

NetManage, Inc. last week shipped Transmission Control Protocol/Internet Protocol software that works with Microsoft Corp.'s Visual Basic application development tool. The software consists of a Visual Basic interface to the NetManage TCP/IP stack and sample applications.

The NetManage TCP/IP protocol stack comes as a Dynamic Link Library and supports either the Windows Sockets applications program interface (API) or the Berkeley Socket API.

The product is priced at $500.

NetManage: (408) 973-7171.

SAP AG recently announced a technology and marketing agreement with **IBM** under which IBM will sell SAP's R/3 client/server and R/2 mainframe application software on IBM RISC System/6000 workstations and servers.

The two companies will codevelop hardware, systems and application software, and databases for open systems, as well as establish joint technology centers in Germany, Singapore and the U.S.

PeopleSoft, Inc. and **William M. Mercer, Inc.,** a human resources consulting firm, recently

See Briefs, *page 30*

"Since my Mac's tied to an AS/400, I'm free to do anything."

A new world is opening up for Macintosh users everywhere—thanks to the IBM AS/400.

With an AS/400 as your server, you'll have access to the information you need to be more productive. Whether you're running a single Mac with Apple's System 7 or an AppleTalk network with a hundred nodes, you'll retrieve data companywide through SNA•ps 5250—and view the results graphically.

The AS/400 has the scalability to grow as you grow, with maximum main storage of a whopping 512MB. Plus 20,000 proven business applications from which to choose. And industrial-strength systems management for superior backup, data protection and more.

There's virtually no learning curve for the AS/400, because it integrates data seamlessly into applications you already know. And for reliability, you can't beat the AS/400, with hundreds of thousands of systems installed and running.

To learn more about how an AS/400 can help take your Mac to the max, call your IBM representative or dial 1 800 IBM-CALL, ext. 102-2. In Canada, call 1 800 465-1234, ext. 735.

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Success Isn't Complicated.

IBM

DATA ACCESS

Q+E Software embeds ODBC in new version of tool

BY BOB BROWN

Boston

Q+E Software, Inc. of Raleigh, N.C., has introduced a new version of its database access software that is based on Microsoft Corp.'s Open Database Connectivity (ODBC) specification.

The Q+E Database Library 2, which was announced at the Business Software Solutions Conference & Exhibition here, is the first major upgrade to the original Q+E Database Library rolled out two years ago.

KALMBACH

Q+E Database Library 2 is designed to let users build applications that can run against multiple databases.

The software is configured as a set of Dynamic Link Libraries (DLL) callable from any development environment that supports DLLs.

Embedding support for ODBC in the software offers a number of benefits, chief among them being the ability for Windows applications to access ODBC-compliant databases, said Booth Kalmbach Jr., vice president of marketing at Q+E Software.

The value that Q+E Software adds to ODBC is that the Q+E Database Library 2 can be called from any programming language, such as a macro language, whereas ODBC is callable only from C, Kalmbach said.

Also, rather than writing directly to ODBC, developers can build to the Q+E Database Library.

That makes it possible to access all of the data sources accessible via ODBC, the Q+E Database Library and those that will be accessible via the Integrated Database Application Program Interface (IDAPI).

Q+E Software has committed to supporting IDAPI, an emerging database access specification backed by Borland International, Inc. and others, when it becomes available.

Jay Ferguson, a senior engineer at American Airlines, Inc. in Dallas, said Q+E Software's support for ODBC will make a huge difference for application developers.

"ODBC promises a baseline standard so that developers can have one set of code to access different databases," Ferguson said. Although he is encouraged by the Q+E Software enhancements, Ferguson said his organization is actually evaluating whether it might be better off using Microsoft's Visual Basic Windows development tool to access databases via ODBC.

Another significant enhancement to the Q+E Software product will be the addition of three new platforms, enabling developers to build programs on one platform and have them run on any of the others.

The new version of the database access tool will initially run on Windows and, by year end, on OS/2. Support for the Apple Computer, Inc. Macintosh, Windows NT and Sun Microsystems, Inc. Solaris is expected to be delivered in the first quarter of next year.

Q+E Database Library 2 will also feature a set of new utilities, including the Q+E Query Builder, a point-and-click tool for building SQL queries without knowing SQL.

Q+E Database Library 2 will be available this month for $699. This single-developer price includes a set of DLLs and drivers, and allows for unlimited deployment of applications built with the software.

✆Q+E Software: (919) 859-2220.

Directory

Continued from page 27

likely to be standards-based or directly interoperable," the study states.

Mike Corujo, a senior systems engineer at the Department of Energy in Germantown, Md., said he would give directory administration "a strong seven on a scale of one to ten" in terms of how time-consuming it is.

The Energy Department has begun linking its Novell, Inc. NetWare and Lotus Development Corp. cc:Mail directories, and plans to do the same for other directories across the organization, he said. The department will initially look to develop common regional directories and move to X.500-based directories from there.

While directory services are important, vendors targeting this market may be disappointed to know that many users are not willing to pay much for a solution.

Personal computer and Apple Computer, Inc. Macintosh users only want to pay about $50 per user for directory services software, while Unix users would ante up $50 to $225, the survey says.

A copy of the Tansy study is available for $395.

✆Tansy Associates: (408) 454-9697.

BRIEFS

Continued from page 27

announced a joint development and marketing arrangement under which the two companies will develop a pension administration system, called PS/Defined Benefits.

The new system, which will be a new module within PeopleSoft's human resources package, is designed for companies that want to manage and administer their own defined benefit pension plans.

The firms plan to ship the product during the second half of 1994.

PeopleSoft: (510) 946-9460.

Fujitsu Networks Industry, Inc., based in Stamford, Conn., has announced the Education Community Center (ECC) software, a Unix-based on-line groupware system designed to let departments, divisions and work groups of colleges and universities share information and communicate.

The on-line groupware system offers a variety of modules that can be implemented as needed, including Member List, File Libraries, Bulletin Board, E-mail, Remote Service Access and News. The system is server-based and can be accessed via local-area networks, campus telephone networks or public phones. ECC costs on average less than $20 per user.

Fujitsu Networks: (203) 326-2700.

EDI revolutionizes London's insurance market

BY ELIZABETH HEICHLER

London

Hardly hidebound despite centuries of tradition, one of Britain's most venerable business institutions has grabbed the ball of EDI innovation and is off and running with it.

The insurance market in London, a business that has barely changed in three centuries, is now souped up and generating about 25 million formatted electronic data interchange messages annually. The roughly 800 companies that are members of the market are benefiting from faster communications, more accurate information and better service.

At the center of the innovation is London Insurance Market Network, (LIMNet) Ltd., which was set up in 1987 to provide greater efficiency through network applications to the brokers and underwriters of the London Insurance Market. It is now the largest commercial insurance and reinsurance network of its kind in the world, transmitting more than 2.5G bytes of EDI trading transactions every month, plus electronic mail and interactive messages.

Key to LIMNet's role is developing standards that are compliant with the United Nations' EDI For Administration, Commerce and Transport (EDIFACT) guidelines. It is also working with European and U.S. reinsurance associations to develop worldwide EDI standards for the industry, according to standards analyst Steve Tetchner.

The physical network supporting LIMNet is IBM's Information Exchange Network. The individual firms can use whatever EDI software they choose, as long as they use the data standards set by LIMNet.

The many companies involved in the market have such a diverse range of hardware and software that it would not be possible to develop software centrally.

Instead, business and technical specifications are agreed upon for each application, and each participating company builds conforming functions into its own systems, according to Andy Gourley, standards manager for the London Insurance Market.

The traditional way of doing business at the London Insurance Market is dependent on personal relationships and face-to-face contact, so it was a challenge to develop applications that preserve the strengths of that approach while addressing some of its inefficiences, Gourley said .

LIMNet helps reduce time spent in meetings exchanging information that could be easily transmitted electronically. It also reduces delays, errors and time spent continually rekeying data when people and paper are the primary communications medium.

The first applications, which were implemented about four years ago, automated the flow of accounting and administrative information between the clearinghouses and the traders. These applications now account for more than 100,000 transactions per day.

More complex messages had to be designed to support the claims process, which can require a complicated dialogue between the broker and the underwriters.

That application lets the broker broadcast a summary of the claim, or updates to it, to all the participating underwriters. They can respond by calling for a consultation and then broadcast the results of this. In the final stage, they can record the terms on which they are willing to settle the claim, which initiates the accounting process.

The Claims EDI messages were introduced in 1991, and by the end of 1992, the percentage of electronic claims and settlements had risen from just a few percent to 50% in the ILU market and 70% in the LIRMA market, or about 40,000 submissions and settlements each month, Gourley said. He added that Lloyd's is currently developing a system to meet the LIMNet Claims message standards.

The most challenging EDI application developed was the one to support the risk-placing process, Gourley said.

He explained that it is essentially an analog of the traditional process: A summary of the risk is broadcast as a combination of data and text to selected underwriters, who, in return, signify their wish to participate subject to conditions. The electronic dialog that results is supplemented by some face-to-face consultation when needed, but at the end of the dialog, an electronic contract is formed.

The London Insurance Market's move to EDI has already resulted in the elimination of some redundant processes, as well as productivity gains for both administrative and professional staffs, according to Gourley.

Gourley said he feels that the network will be further exploited to develop insurance products and new methods of distributing them. And with the network infrastructure in place, he added, the market is now in position to harness future technologies such as graphics and imaging.

⊷ Heichler is a European Correspondent for IDG News Service.

Notes

Continued from page 27

a single-user interface and an applications-building environment, and integrates messaging and database functions, which are fundamentally important to the exercise of work flow.

How will third-party products plug into Notes?

They will use the Notes [application program interface] to access a variety of functions. For example, Action Technologies, Inc.'s products use the Notes API to generate a variety of Notes forms used within different work processes.

Also, third-party products can take advantage of the Vendor Independent Messaging tool kit, which supports messaging and transport integration.

For example, Reach Software Corp. will employ VIM extensively for driving the messaging function within its intelligent routing engine.

Will Notes serve as a common interface between multivendor work flow tools so users can exchange information between these tools?

Not exactly. This is where the [newly formed] Workflow Management Coalition comes in. The coalition, which has about 25 vendors as members, is working on developing a standard interchange format between multivendor systems.

It's one thing for products to plug into Notes, but it is another for them to exchange control information or instructions that the other side can comprehend.

Two years ago, Lotus said it would provide work flow capabilities via a Notes Companion product based on Action's work flow engine. That strategy seems to have changed. Why?

Essentially, we wanted to level the playing field to bring in additional work flow partners. The breadth of the market for work flow and business process reengineering tools is significant.

One product isn't sufficient to cover all areas.

We also had a number of potential partners who were ambivalent about working with us because of our relationship with Action.

Many companies, such as Reach Software, were reluctant to approach us to talk about whether to integrate Notes with their product. That's when we decided to change course.

What's your relationship with Action now?

Lotus continues to endorse Action as a strong provider of add-on functionality. Action is now going into beta with a Notes-based work flow tool, and we are assisting them in that.

We have provided them with a list of beta sites that were part of the Notes Version 3.0 test program.

How will Lotus balance internally developed work flow tools that become core functions within Notes with externally integrated work flow tools from third parties? Is there any potential for conflict?

We have never made a secret out of the fact that we are planning to enhance the core product.

If you looked at all the work flow providers and found functionality that they all had in common, it's a safe bet that it is [because of] the functionality that we will put into the core of Notes.

It has been reported that Lotus is working on embedding work flow agents within Notes as part of Version 4.0. How will this extend the work flow capabilities?

These are mostly personal agents or daemons that users can program to instruct the system what to do for them. For example, if you go away on vacation,

Notes will automatically handle incoming messages, images, faxes and documents according to predefined specifications. In addition, Notes could be easily programmed to pull off pertinent articles from news wire feeds, among other things.

Lotus work flow partners

Companies that have work flow products integrated with Lotus Notes:

Company	Product	Product description	Phone number
	Shipping		
Application Partners, Inc.	Workflow Innovation Toolbox	Rapid work flow development tool kit	(908) 276-7222
Electronic Labor Force, Inc.	Desktop Legal Services	Integrated legal applications	(206) 232-7808
Quality Decision Management, Inc.	Quality at Work	Customer management system	(508) 688-8266
Trinzic, Inc.	InfoPump	Data warehouse tool	(617) 647-2904
	In development		
Action Technologies, Inc.	Action Workflow System	Business-process reengineering tool	(510) 521-6190
Edify Corp.	Electronic Workforce	Sales automation software	(408) 982-2043
Intelligent Electronics, Ltd.	W6	Scheduling system	011 972 349 7814
Reach Software Corp.	WorkMAN	E-mail-based work flow	(408) 733-8685
Staffware Corp.	Staffware	Work flow automation tool	(617) 239-8221

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: LOTUS DEVELOPMENT CORP., CAMBRIDGE, MASS.

Editorial

For the past couple years, I've been subjected to a lot of grumbling about INTEROP — in particular, how INTEROP just ain't what it used to be. I hear that gripe from users and vendors, and even read it in the trade press.

The INTEROP of old is the Walton's Mountain of events, representing a bygone era to which nostalgics long to return — even if they were never there to begin with. (It should be noted that I wasn't at the earliest INTEROPs.)

People lament the "commercialization" of INTEROP and the declining ratio of ponytailed internetworking gurus to pinstripe-suited marketing execs. But I don't buy it. INTEROP *is* a commercial venture and has been since early on. It owes its success to savvy marketing and great timing, having caught early the networking wave that gave rise to a whole new generation of companies, including my own. INTEROP's growth reflects the growing importance of networking in our society and the diversity of the network industry. These days, you can find stories about the Internet on page 1 of *The New York Times* and see software vendors such as Microsoft and Lotus rubbing elbows with hub and router makers on the INTEROP exhibit floor.

Complaining about INTEROP is akin to lamenting the rapid growth of the Internet. The Internet ain't what it used to be either, but it is becoming more and more useful as new resources and new people come aboard.

That said, there is one INTEROP issue that does raise some genuine concern — the show's move to Las Vegas next year. To hear some folks talk, Dan Lynch and company might as well be relocating INTEROP to the First Circle of Hell. Las Vegas doesn't top the list of favorite conference sites.

Like ComNet and Washington, D.C., INTEROP has close ties to the Bay Area and Silicon Valley. Attendees and vendor executives I met with at the swan song San Francisco event questioned whether the INTEROP Co. is as concerned with the welfare of exhibitors and conference-goers as it is with overrunning Comdex. Exhibitors, in particular, are concerned about the loss of attendees from surrounding communities — a legitimate issue.

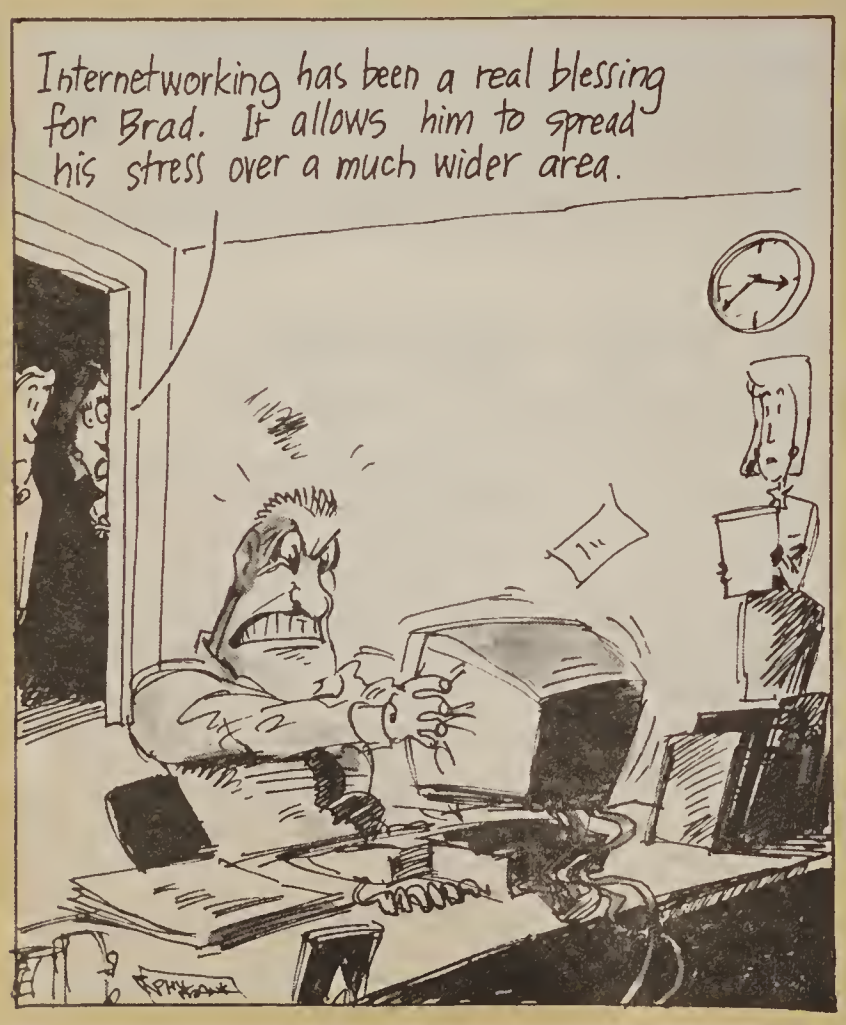
INTEROP's Lynch says the move is simply a matter of logistics. San Fran can't handle the exploding growth in attendance, which reportedly hit 65,000 this year. He claims that the Las Vegas version won't suffer any decline in the quality of attendees.

What do you think? Does the move change your view of INTEROP? Does Las Vegas leave you cold? Will you be attending? Let me know.

JOHN GALLANT

Teletoons

FRANK AND TROISE



SECURITY PERSPECTIVES

By Michel Kabay

Information warfare could be more than fiction

Imagine what it would be like to bank without automated teller machines in today's world. Or travel without the aid of airline reservation networks, phone across the continent without direct-dial service, or make credit card purchases if the card verification network were not operating. Imagine what it would cost in terms of productivity and easy access to information if the Internet went down.

All of these perquisites of modern society depend on information nets that are susceptible to debilitating attacks. We all must turn our attention to protecting our networks against attack — individually, as network managers; in a corporate sense, as executives depending on and funding networks; and nationally, as citizens of information-dependent societies.

We also must learn all of our network vulnerability points. Only then will we be able to devise a strategy to fortify our networks against the type of information warfare that leading author Winn Schwartau writes about.

If Schwartau is right, terrorists, corrupt corporate executives and hostile governments are capable of putting technologically advanced countries two generations back in time without guns and bombs. They could simply attack pivotally important enterprise networks.

Schwartau wrote *Terminal Compromise,* a 1991 techno-thriller that explores the methods through which systematic attack on information networks could cripple the U.S. His new book, *Information Warfare,* is due in bookstores this month. It's a serious look at a serious threat.

In Schwartau's view, the next major world conflict is more likely to involve computer viruses, high-energy radio-frequency guns and electromagnetic pulse bombs than tanks, grenades and atomic bombs.

Let's use viruses as an example of how a systematic attack could damage our networks. Viruses are currently a form of electronic vandalism. However, they could easily be used for information warfare by a determined opponent with enough money.

According to recent studies, computer viruses are already costing U.S. computer users almost $1 billion in direct costs such as the purchase of antivirus software and indirect costs such as lost productivity. Disruptions caused by viruses include system and network unavailability, data loss and just wasted time.

A person known as the "Dark Avenger from Bulgaria" writes viruses that cause subtle bit switches randomly throughout memory. He boasts that he does this because he likes to destroy other people's work.

As far as we know, the virus plague is more the result of unorganized activity by thousands of young people — and juvenile personalities — around the world than professionals offering their services to the highest bidder.

But what if virus writing and distribution were organized?

Schwartau envisages a determined, coordinated attack on data integrity by means of carefully engineered, selective computer viruses. Instead of just twiddling bits at random, these viruses would attack specific programs.

Even now, there are already viruses that attack antivirus programs. What if there were viruses aimed at damaging only Lotus Development Corp. 1-2-3 or Microsoft Corp. Excel spreadsheet programs? In *Terminal Compromise,* such viruses cause subtle changes in a spreadsheet's mathematical routines. Calculations are subtly off — say by a few percentage points — now and then. Can you imagine how much damage such spreadsheet viruses could cause?

What if such viruses attacked the software controlling network components? Many networks use Intel Corp. chips in their servers. What if there were viruses that attacked Novell, Inc. NetWare and Banyan Systems, Inc. VINES? Or how about a virus that attacks the software used in packet assembler/disassemblers?

Information warfare viruses could be designed with a much longer latency period than amateur viruses. They could remain invisible for years with no obvious effects, replicating all the while. Bulletin boards purporting to distribute free software could be set up to distribute virus-infected software. With no obvious effects to alert antivirus researchers, it is unlikely that antivirus products would include signature strings for such viruses. Penetration of the target population could be near complete.

Another attack open to determined opponents and described in Schwartau's *Terminal Compromise* is infiltration of commercial software manufacturers.

For example, what if Oracle Corp. database engines were deliberately, subtly modified to cause intermittent errors? What if the operating system for, say, Tandem Computers, Inc. computers included a deliberately planted bug?

Impossible, you say? Quality assurance works when there are thorough controls over the production process. But no system has yet been devised that cannot be subverted by an intelligent opponent who has supervisory privileges.

For example, a shipment of Aldus Corp. Freehand programs was accidentally contaminated by the Brandow virus because an infected Mr. Potato Head game was loaded onto a production computer after quality assurance was complete.

Deliberate infiltration of the production team in a firm could allow damage to any software. So as far-fetched as it may seem, the potential for information warfare cannot be taken lightly.

P.S.: Schwartau will elaborate on the many plausible themes presented in his books and look at interpersonal, corporate and international information warfare when he speaks at the National Computer Security Association's (NCSA) Information Warfare Conference on Sept. 15 in Montreal. His books are available from the NCSA in Carlisle, Pa. Schwartau can be reached via the Internet at p00506@psilink.com.

Kabay is director of education with the National Computer Security Association in Carlisle, Pa. He can be reached on the Internet at 75300.3232@compuserve.com or by phone at (514) 931-6187.

INTEROP 93

By Christopher Finn

Leading-edge focus shortchanges users

On my way back from INTEROP 93 in San Francisco, my brain kept struggling to deal with sensory overload. INTEROP is the rising star among networking conferences, and there is no doubt about its increased following. Still, there is something amiss.

No, I was not disgusted by the number of "suits" at what was once a nerds-only event. After all, I am best categorized as a suit myself. Nor am I talking about the mass of people at the show, the INTEROP souvenir stands or even the magician who tried to pull a Fiber Distributed Data Interface adapter out of my ear.

What was missing was a dose of reality and perspective among the glitz and spokesmodels. The simple fact is that most user networks and the applications running on them are becoming increasingly distant from the so-called leading edge being discussed and marketed at the show.

For example, I'm not sure how many corporate networks will require the capability to simultaneously run a multimedia groupware application and show the chase scene from *The Blues Brothers* on the same terminal. And don't tell me about medical imaging or insurance claims again.

Don't get me wrong, it's great that vendors can put all their new high-bandwidth products on a show net that runs at gigabit-per-second speed. But the impact of the functioning multivendor, multitechnology show net is minimal compared to the hype for each vendor's chosen technology.

Contrary to popular opinion, Asynchronous Transfer Mode (ATM) will not cure athlete's foot, nor will it eradicate plaque. And most of all, it will not be the answer for every local-area network, campus and wide-area connection. For LANs and campus nets, ATM switches will play an increasingly major role, but most organizations will swallow change in small doses. End-to-end ATM presents some major benefits for high-bandwidth users such as engineers and graphic designers, but the average office worker is not going to see the difference. Save your money on megabit-per-second charts; Ethernet is still the most cost-effective alternative for small work groups, and I don't expect that to change soon.

For the wide area, ATM will fit the needs of all of your sites — if you can afford unchannelized T-3 access at about $8,000 to $10,000 per month per site. "ATM at T-1," you say. That's great, except you lose one- third of your bandwidth to protocol overhead. "I can just put my voice and video over it," you say. Well, you might check with your carrier and private branch exchange vendor before you pencil it in. Carriers have spent a lot of money on their time-division multiplexer circuit-switched nets and are not likely to have their Northern Telecom, Inc. DMS-250 and AT&T 4ESS switches instantly outdated.

The fact is that various interconnectable user interfaces, including ATM, frame relay, Integrated Services Digital Network and private lines, will ride over and talk to each other on the multiprotocol ATM-based carrier net of the future. Scale, installed equipment and bandwidth requirements will determine whether native ATM is the solution on a site-by-site basis. The majority of users may never migrate all — if even any — sites to higher speed native ATM. Even so, we will all benefit from the efficiencies gained by use of ATM in the carrier backbone.

The gee-whiz nature of INTEROP was severely contrasted by the user input at the *Network World*/TeleChoice, Inc. frame relay user group meeting held during the show. At this meeting, users talked about how migrating from low-speed multidrop networks to exponentially faster 256K or 512K bit/sec frame relay nets saved their organizations thousands of dollars during the past year.

"My job is to positively affect the bottom line, not wait around for the next big thing," one user said. "After all, my budget is shrinking."

This is not to say that we should all ignore ATM and other promising technologies. ATM is truly the next big thing. However, it is the responsibility of the industry to educate before bombarding the customer with sales pitches. You cannot buy what you do not understand.

The INTEROP show should concentrate on the current needs of the average user rather than catering only to cutting-edge users such as Hughes Aircraft Co. and the National Aeronautics and Space Administration. Let's see panels of users at the show who have been able to get the most utility out of Novell, Inc.'s NetWare or have been able to engineer an extremely efficient internetwork on a budget. Users need more practical solutions to everyday issues.

Finn is a senior analyst with TeleChoice, Inc., a Verona, N.J., consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. He can be reached at (201) 239-0700 or via MCI Mail at 445-4690.

Letters

Address advocate

I have to agree with Joseph Uhrmacher's plea for vendor addresses (Aug.16, page 38). I would very much like to sacrifice reading one sentence out of an article to have a company address, Internet address and "normal" (not 800) telephone number of the company featured in that article. That's all it would take, just one sentence!

John Jobst
Computer specialist
U.S. Army Corps of Engineers
St. Louis

Wants more

Regarding the issue of printing vendor phone numbers vs. addresses: I prefer a full address and both direct and 800 telephone numbers. I may be in a location, such as the Bahamas, where an 800 number cannot be called, or a location where it is difficult to make a telephone call.

I have found times when, after leaving a voice mail message, I do not get the requested information. This can happen with a letter, but less often since more information can be presented in a letter and read by the recipient.

Glenn McLain Jr.
Orlando, Fla.

Independent certification best

Concerning the current hype around Novell, Inc.'s Certified Netware Engineer (CNE) designation (Aug. 2, page 33): Why become certified in one proprietary software package? Why restrict yourself by becom-

See **Letters**, *page 43*

Rootin' for Newton

I enjoyed Fredric Paul's pithy article, "Tiny devices pose big net challenges" (Aug. 2, page 1). It was refreshing to read about MIS issues regarding new technology such as Apple Computer, Inc.'s Newton.

Having said that, it would have been a boon for readers to also have been given additional insight into the types of applications that may be involved with these meandering devices.

Since the technology is so new, many readers probably don't have a very good idea of the potential applications Newton represents in a security setting. Surprisingly, several organizations are shipping Newton-ready applications now, and many more have applications in the works.

Kudos to Mr. Paul and *Network World* for what is otherwise a fine (and greatly needed) piece on Newton technology. I hope to see a follow-up on this topic, which also considers development and connectivity issues.

Mark Ware
Site support software analyst
Data Systems Analysts, Inc.
Fairfax, Va.

Editor's note: We agree that additional insight on wireless data networking issues and personal digital assistants (PDA) is needed. That's why a special issue on the subject of wireless networks will appear in the Oct. 18 edition of Network World.

Praise and a plea

Your article on Newton was nice to see. More coverage of PDA in general would be interesting. I also liked the coverage of the gopher facility on the Internet (Aug. 16, page 14).

I have been seeing a lot about Asynchronous Transfer Mode (ATM) in the networking trade journals, but no one has explained what it really is. A short technical summary would really help. Thanks.

James A. Babcock
Software engineer
Eon Corp.
Reston, Va.

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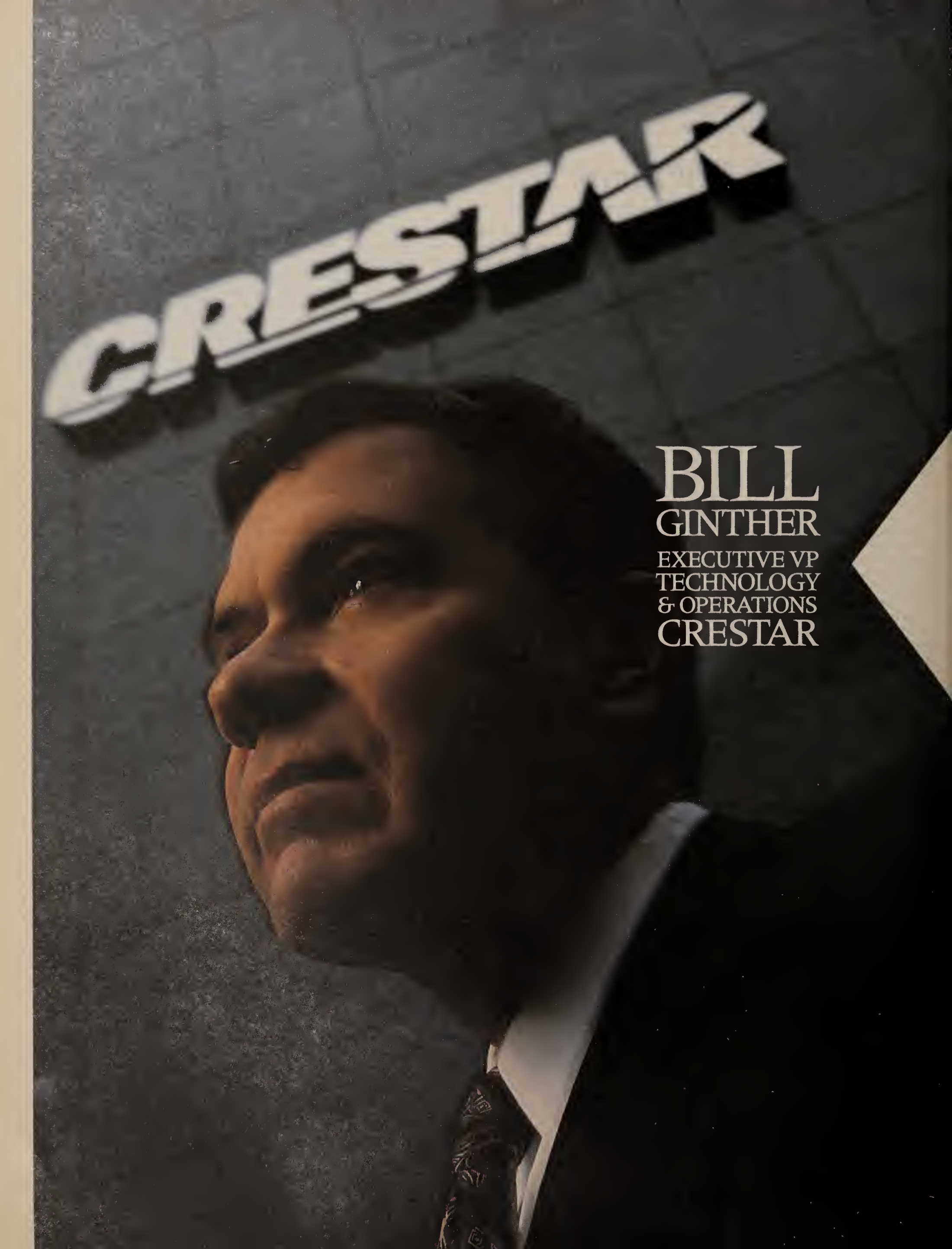

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Buyer's guide

CAPitalizing on local access

After weighing a host of variables, users may find alternative local access providers are a competitive option to LEC services.

BY DANIEL BRIERE AND CHRISTOPHER FINN

Once the province of a lucky few, alternative local access providers are now within the reach of many.

Also known as competitive access providers (CAP), these companies give users an alternate path through the local telecommunications network to their interexchange carriers and other sites. In addition, they offer a range of standard telephone company services, such as Centrex and high-speed local-area network connectivity.

The good news for network managers is these providers are extending the depth and breadth of their respective offerings, expanding their coverage to major cities and enhancing their services monthly.

Today, these alternative local carriers are competing in more than 20 metropolitan areas, with cities such as New York and Los Angeles sporting as many as five competing carriers, in addition to the local regional Bell holding company carrier option.

Because so few CAPs compete in the same metropolitan markets, the likelihood of users evaluating CAPs against one another is slim. Instead, users that consider using CAPs likely will do so as a means of bypassing local telephone companies for reasons of price, rapid circuit installation or other factors. Conversely, many users are also evaluating CAPs today as a means to augment local telephone company service and provide route redundancy in the local loop.

What's more, these access providers are well positioned to serve users' local access needs. In fact, CAPs just won another regulatory round at the Federal Communications Commission, allowing them to offer switched services along side their historical dedicated circuit offerings. Long term, the decision will enable these carriers to offer a full slate of services to end users.

For subscribers, the ruling means more competition, better services and lower prices at a time when every penny saved counts.

In fact, in some areas, such as LAN interconnection services, CAPs are actually taking the lead and offering services not yet available from incumbent phone companies. In many instances, end users are seeing these entrepreneurial firms aggressively embracing new leading-edge technologies, launching offerings such as 100M bit/sec data transport well before their RBHC counterparts.

The message is clear: Competition in the local loop has finally arrived. Soon users will be able to turn to CAPs for almost any service obtainable from a local carrier in almost any major city.

However, users just won't rush out and sign up for any of these services. In evaluating the potential use of any CAP, net managers need to weigh a laundry list of factors, such as geographic service availability, contract and service flexibility, net reliability, management, price and, possibly, the availability of high- speed LAN interconnection services.

In examining these areas, users are likely to uncover some significant differences among CAPs and weigh some valid reasons to use them instead of, or in conjunction with, local exchange carriers.

TELLING PLAYERS APART

There are many industry terms for alternative carrier firms. Names such as competitive access providers, alternative access carriers and bypass carriers have been kicked around for years. Regardless of which tag is used, the word "access" almost always accompanies this class of service providers. Unfortunately, this understates the actual range of services these providers offer.

Companies such as MFS Communications Company, Inc. and Teleport Communications Group, Inc. (TCG) are offering links up to Synchronous Optical Network (SONET) speeds, Centrex and even switched voice services. In addition, they are offering advanced services not just in a single city, but across many major metropolitan areas.

As one can see from the chart beginning on page 38, the range of services these carriers offer challenges those of any RBHC.

Although service portfolios from CAPs can vary widely, it really comes down to two types: dedicated bandwidth and switched voice services. In the former category, the high end of the market is occupied by the latest native LAN-speed services. Several CAPs, including two that were surveyed — MFS Communications and TCG — offer native LAN services in speeds of 100M, 16M, 10M and 4M bit/sec. Intermedia Communications of Florida, Inc. even offers frame relay services on its metropolitan networks.

Most CAPs also offer more traditional DS3 service, although the majority of customers use DS1 and DS0 private circuits. Most often, these circuits are used for access to interexchange carriers.

Increasingly, some of the more sophisticated CAPs, such as MFS Communications and TCG, are installing digital switches to provide plain old telephone service and digital Centrex. Recently, an FCC ruling has made it more likely that CAPs will play a larger role in switched service provisioning, although it may be near year end before users start seeing new services that take advantage of this regulatory flexibility (see story, page 39).

CATV companies adding alternative access to their programming. Page 42.

CAPs themselves fall into two general categories, as well — multicity and regional providers. The first group includes MFS Communications and TCG, which have been able to successfully consolidate operations in a large number of metropolitan areas. MFS Communications reaches the largest number, 14, with TCG close behind with 10. These two constitute the majority of the CAP market revenues. By offering alternative access service in so many cities nationwide, MFS Communications and TCG can, in some cases, service major corporations' needs better than other CAPs or even telephone companies by providing unified net management, billing and other services.

"We focus on areas where user needs are going unmet," says Robert Atkinson, senior vice president of regulatory and external affairs at TCG. "And we'll meet our competitors service by service if necessary."

There are a few providers that have operations in two cities, but the majority have operations in only one city at this time, according to Datapro Information Services Group, a market research firm in Delran, N.J.

These smaller players, such as Electric Lightwave, Inc., Intermedia Communications of Florida and Eastern Telelogic Corp., should not automatically be dismissed just because they operate in one or two regions. These carriers provide a choice for basic local access, which comprises almost 85% of a CAP's overall revenue. More often than not, these smaller providers have chosen second- and third-tier cities to enter, giving users an option to local telephone companies in those markets.

Generally, these players offer at least the basic DS0 and DS1 services and are more likely to accommodate custom requests for service. Some of them, such as Local Area Telecommunications, Inc. (LOCATE) also are able to set up digital microwave facilities for a single customer's needs. However, they may not have as comprehensive a service lineup as some of the larger players, which may be important to end users looking for a full suite of services.

All of these providers work closely with the interexchange carriers, which are their bread-and-butter clients. Interexchange carriers bring many customers to CAPs, and they have

Continued on page 38

Competitive access providers

Company	Network composition		Traditional access services													Native LAN-speed services	Geographic presence L = Native LAN-speed services T = Traditional access services											No. of other U.S. cities	Interexchange carrier certification
	Digital fiber percentage	Digital microwave percentage	DS0	DS1	DS2	DS3	DS1E	Channelized DS1	Reserved DS1	Reserved DS3	Centrex	POTS	OC-3	OC-12	OC-48	(M bit/sec)	New York	Los Angeles	Chicago	Houston	Philadelphia	Washington, D.C.	Boston	Detroit	Dallas	Santa Monica, Calif.	Indianapolis		A = AT&T M = MCI S = Sprint
Associated Communications of Los Angeles (213) 337-9271	5	95		✔		✔												O								O		10	
Bay Area Teleport (800) 621-5003	10	90	✔	✔	✔	✔	✔	✔																				8	A
City Signal, Inc. (616) 235-4990	100		✔	✔		✔	✔	✔					✔	✔	✔	4, 10, 16, 100								L, O			L, O	5	M
Eastern Telelogic Corp. (215) 337-8899	100		✔	✔	✔	✔	✔	✔		✔			✔	✔	✔	4, 10, 16, 100					L, O								A, M, S
Electric Lightwave, Inc. (206) 892-1000	100		✔	✔	✔	✔	✔	✔	✔	✔			✔	✔	✔	4, 10, 16, 100												2	A, M, S
Indiana Digital Access (317) 849-5639	100			✔		✔										10											O		M, S
Intermedia Communications of Florida, Inc. (813) 621-0011	100		✔	✔	✔	✔	✔	✔	✔	✔			✔	✔	✔	4, 10, 16, 100												5	A, M, S
Local Area Telecommunications, Inc. (LOCATE) (212) 509-5115		100	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔				4, 10, 16, 100	(1)												A
MetroComm AxS (614) 221-9230	100		✔	✔		✔			(2)	(2)																		1	A, M, S
MFS Communications Company, Inc. (708) 218-7200	100		✔	✔		✔	✔	✔			✔	✔	✔	✔	✔	4, 10, 16, 100	L, O	L, O	L, O	L, O	L, O	L, O	L, O		L, O			6	A, M, S
Mtel Digital Services, Inc. (714) 833-7171	33	67				✔	✔																			O		9	
MWR Telecom (515) 242-4360	100		✔	✔	✔	✔		✔					✔	✔	✔	4, 10, 16												2	M
Penn Access Corp. (412) 338-9090	100		✔	✔		✔		✔	✔	✔			✔	✔	✔	4, 10, 16, 100												1	A, M, S
Teleport Communications Group, Inc. (800) 628-5608	100		✔	✔	✔	✔	✔	✔			✔		✔		✔	4, 10, 16	L, O	O	O	O			L, O		O			4	A, M, S

Products highlighted by color were selected for The Short List.
(1) LOCATE serves 50 states via private microwave systems.
(2) On an individual case basis.

OC = Optical Carrier
POTS = Plain old telephone service

SOURCE: TELECHOICE, INC., VERONA, N.J.

Continued from page 37

certified a number of CAPs that are allowed to interconnect with their respective networks. The Buyer's Guide chart indicates which interexchange carriers can link to specific CAP networks.

GEOGRAPHIC AVAILABILITY

Most users are finding it advantageous to use a CAP in conjunction with their local exchange carriers, rather than in place of them. "In our various offices, we use both the local carrier and a competitive access provider for disaster avoidance," says Ronald West, senior manager of Telecommunications and Office Automation for Shearman & Sterling, a New York law firm.

CAP connections are not used solely for backup services, West explains. "We are using both connections actively in order to split traffic," he says.

The first step in evaluating the CAP option is whether service is available in the required geographic area. However, that is not as simple as it may seem since CAP services vary by city, segment and building covered.

The Buyer's Guide chart shows the major cities where CAPs are set up to offer services. But what the chart doesn't show, on a carrier-by-carrier basis, is whether a provider has the actual right-of-way agreements to bring service to a company's doorstep.

The most basic issue when looking at alternative access is whether any CAP serves a user's specific location. CAP networks usually crisscross a city, with access lines running off the carrier's backbone into specific buildings where subscribers reside.

CAPs have installed networks in the most business-dense areas of a metropolitan area first. This means that an end user may have connectivity at a headquarters site but not at a warehouse or branch office. If a CAP already has access to a building in which a company resides, getting incremental service within that building will likely be an easy task. If not, then the CAP must justify installing new access channels to serve a company and other potential clients at that site.

Most CAPs require their own on-site room in a building for termination of their cable. CAPs also seek building entry routes that are separate from those used by the local exchange carriers. Such diversity is one of the most attractive features to a subscriber because the actual paths taken and logic used is totally separate from that of the local exchange carrier.

However, users should be careful to get a firsthand look at their particular route and the facilities used to transport the traffic. All CAPs use varying types of facilities. In areas where the RBHC is cooperative, the CAP may lease facilities from it, so users may not actually be able to obtain true route diversity on an end-to-end basis.

While one would think diverse building access would be an attractive addition to any business property — prompting landlords to seek out CAPs for interconnection — many building owners are not required to give a CAP access to the building, at least not for free. Although many landlords, such as those of Wall Street fame, provide access to as many carriers as possible for their tenants as an extra service, others charge exorbitant fees to the CAP or simply refuse access entirely.

End users should seek to add clauses to lease agreements to bind the landlord in providing alternative local access at little or no extra charge.

All of this means users should check with CAPs to judge availability at a particular site. New switched access services, enabled by the recent FCC decision, will lessen this issue somewhat because end users could use the local exchange carrier Public Switched Telephone Network (PSTN) to access CAP services. However, the local exchange carrier PSTN will not readily support advanced data services, as do CAPs, which require dedicated access.

Also, it is unclear what risk the customer has in losing the inherent diversity of the existing CAP network since the calls will be traveling over the same routes as the local exchange carrier's PSTN.

The Short List

CAPs

The Short List highlights competitive access providers (CAP) that Network World *recommends you examine during the selection process. CAPs were selected for The Short List based on their geographic presence, range of services and unique service features that set them apart from other offerings.*

■Intermedia Communications of Florida, Inc. Intermedia offers services in the Florida area only, but it is a technically advanced CAP and offers a broader range of advanced services than the local exchange carrier, BellSouth Corp. For instance, Intermedia Communications of Florida offers 4M, 10M, 16M and 100M bit/sec local-area network interconnection services. BellSouth, meanwhile, offers LAN interconnection but not at 100M bit/sec.

Intermedia Communications of Florida was the first CAP to offer frame relay services. Today, it offers a nearly complete lineup of networking services, including every service listed in the chart on page 38, with the exception of plain old telephone service (POTS) and Centrex.

■Local Area Telecommunications, Inc. (LOCATE). LOCATE is the only CAP that provides 100% microwave-based connections nationwide. Thus, LOCATE services might appeal to customers situated in areas where there is no other CAP and the only choice is a local exchange carrier, or where local exchange carrier services might be inconvenient — for instance, when tying together two sites across a river.

While LOCATE provides dedicated lines and access to interexchange carriers, it does not offer any of the native LAN-speed services available from many other CAPs.

■MFS Communications Company, Inc. MFS Communications is one of the two largest CAPs and operates in 14 metropolitan areas throughout the U.S. It has more customers, more lines and operates in more parts of the cities it serves than any other CAP, with the exception of Teleport Communications Group, Inc.

MFS Communications offers a complete suite of advanced voice services, such as Centrex and Extended Area Calling. It also offers extensive data services, ranging from basic private lines to native LAN-speed interconnection services, dubbed High-speed LAN Interconnection, operating at 4M, 10M, 16M and 100M bit/sec.

MFS Communications in August became the first CAP to offer an Asynchronous Transfer Mode (ATM) service, with a new service connecting 10 U.S. cities. The firm also provides flexible services on a custom basis, such as quick installation services and collocation of customer network access equipment at the its point of presence (POP). MFS Communications offers its services over a 100% digital fiber net.

■Teleport Communications, Group Inc. (TCG). TCG is the other heavy hitter in the CAP arena, with basically the same strengths as MFS Communications. The firm offers services in 10 cities, ranging from such voice services as Centrex and Extended Area Calling to such data services as dedicated lines, interexchange carrier access and 4M, 10M and 16M bit/sec services. However, 100M bit/sec services are not offered.

TCG offers network reliabilty and availabilty guarantees, which top those provided by most local exchange carriers. Like MFS Communications, TCG allows collocation of customer equipment at their POPs on a custom basis and is flexible regarding other unique customer requests. TCG's network is also 100% digital fiber.

Second-city coverage

While making sure CAP service is available to a business' doorstep, it's also important to spot new markets where services are being offered. And here is where there is quite a lot of activity.

Alternative access providers now exist in secondary markets such as St. Louis and Tulsa, Okla. Richmond, Va., is probably the newest entrant to the CAP availability chart — Virginia MetroTel, Inc. just received regulatory authority to compete in that market.

Still, some markets may never land CAPs to compete against local telelephone companies. A combination of regulatory climate and lack of business density may serve to keep many CAPs out of some markets indefinitely.

"A market must be technologically viable, regulatorily viable and economically viable before we will enter it," says TCG's Atkinson. The number of cities ripe for CAPs is low, and "that list is getting short."

In lieu of moving directly into some secondary or tertiary cities, some CAPs are pursuing strategic partnerships. TCG has recently announced that it will install fiber in joint ventures with cable televison companies to reach some cities where it would otherwise be economically unfeasible to provide service. Still, other CAPs may offer to provide switching architectures on top of an existing CATV provider's net, which typically has the rights-of-way and installed network to end users.

Don Moore, manager of communication technology at Aldus Corp. in Seattle, notes that simple availability can be a dealstopper. "We might like to connect our Redmond [Wash.] and Seattle sites with CAPs, but only one is served," he says, quickly adding that he expects this to change soon.

Most CAPs are concentrating much of their efforts in extending their in-place metropolitan networks rather than adding new cities. As new subscribers request service, the number of buildings served by CAPs with their respective cities increases.

THE FLEXIBILITY FACTOR

Once an end user has determined it is possible to purchase service from a CAP, the argument must be made to do so, especially if the alternative is a reliable local telephone company.

Key to the current success of CAPs is the fact that they can be more responsive to customer requests than the average local exchange carrier. "If a user asks for something off-tariff, the RBOC has to deal with regulatory issues that the CAP doesn't," says Colleen Beck, managing analyst at Datapro. "For this reason, the CAP can answer that need more quickly."

85% of CAP revenues stem from services that provide access to an interexchange carrier.

Therefore, CAPs can quote as few as 15 days for installation of a circuit, while RBHCs generally take between 30 and 60 days. If a CAP already has service into a building, new circuits may be turned on in a matter of hours.

Of course, installation time frames vary by service. It is far easier to add an additional DS0 to a current subscriber than four new DS3s simply because available capacity might need to be constructed to meet the latter demand. In such cases, installation could take 60 to 90 days.

Still, the quicker installation periods for the CAPs is pressuring the RBHCs to respond in some manner. New York Telephone Co., for instance, launched fiber-based private-line services ranging in speed from 64K to 100M bit/sec that can be installed and reconfigured in as little as one hour.

Those offerings, dubbed Enterprise Services, use new network nodes that consist of fiber multiplexers and high-speed digital access and cross-connect systems interconnected using Fiber Distributed Data Interface rings. Firms access the nodes via on-premises, carrier-owned and operated intelligent channel banks and fiber muxes. Moreover, the Enterprise Services cost 15% to 20% less than current New York Telephone private-line offerings and boost the carrier's competitiveness against CAP offerings in New York.

The RBHCs still have a ways to go to convince end users that they have changed their ways, however. First Data Corp.'s Health Systems Group, based in Charlotte, N.C., currently uses several alternative access providers because it is dissatisfied with its local exchange carrier.

First Data looked into CAPs when the company needed to move data hubs from remote sales offices to a carrier premises for outsourced collocation and management. First Data approached its local exchange carrier but ended up choosing TCG because it offered the firm a collocation agreement for the data hubbing equipment; implementation was quick and smooth.

"The LEC lost our business because it did not feel we were a large enough firm to bother with for that type of service," says Dave Townsend, manager of network communications planning and installation at First Data. "[TCG] seemed to understand and adapt to our nonstandard situation."

EVER-PRESENT RELIABILITY

Another evaluation point is that a CAP may offer enhanced network reliability over available local exchange carrier services. And indeed, most CAP networks are based on new technologies, such as SONET and fiber-ring architectures, which are state-of-the-art and inherently offer higher levels of network availability and error-free transmission.

The most important issue is network availability, or how often the network is up. For instance, TCG quotes an availability rate of greater than 99.99% for all of its dedicated services. This is as good as or better than any of the local exchange carrier networks. TCG also quotes error-free seconds at 99.9%. New York Telephone's figures for private-line service are 99.96% guaranteed uptime and 98% for error-free seconds.

Some users have noticed the difference. "We noticed slightly higher availability and

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The switch is on

The Federal Communications Commission took yet another step in the deregulation of the CAP industry last month when it adopted a set of rules that open up the local exchange market to greater competition.

Under the new rules, local exchange carriers would have to provide competitors with a yet higher level of interconnection and permit interconnectors to terminate their own switched access transmission facilities at local exchange carrier central offices, wire centers and tandem switches. That enables the competitive access providers to pick up and drop off switched traffic destined for standard Public Switched Telephone Network lines. Local exchange carriers must file tariffs for such interconnections by Nov. 18.

These rules somewhat mirror the rules for interconnection of special or dedicated access, which have spawned the current CAP market.

In exchange for these concessions, local exchange carriers will now be allowed additional pricing flexibility for interconnection and to offer term and volume pricing plans for switched access. Although local exchange carriers are sure to lose market share due to this ruling, they will receive about 80% of whatever they lose back in new access fees from the competitors.

What this could mean to users is lower costs for switched access services. Right now, the local exchange carrier adds about 4 1/2 cents to each end of a switched access phone call, charged to the interexchange carrier and passed on to users. That's why dedicated access WATS rates are lower by about that amount — there is no switched access fee charged to the carrier.

Currently, competition for the transport of that traffic and the advent of volume pricing by the local exchange carriers is sure to drive those prices down, and the savings will be passed on to customers, just as they were in the past.

CAPs are still lobbying for lower rates for interconnection and still believe they have a long way to go. "This decision just clears away the rhetorical underbrush," says Robert Atkinson, senior vice president of regulatory and external affairs at Teleport Communications Group, Inc. "There is still a lot of work to be done before we have a level playing field."

BY DANIEL BRIERE

Continued from page 39

error-free performance from the CAPs that we use, but it is not a big difference," Townsend says.

In some cases, these differences can be deceptive. "It is not always true that the CAP will have a more robust network, so the customer should make them prove it," Datapro's Beck says. End users can request to see network downtime reports and can even check

LEC/CAP rate comparison
for basic services in New York

Teleport Communications Group, Inc.	
DS0, 1-year contract	$114
DS0, 3-year contract	$103
DS1, 1-year contract	$728
DS1, 3-year contract	$624
New York Telephone	
DS0, 1-year contract	$100
DS0, 3-year contract	$90
DS1, 1-year contract	$479
DS1, 3-year contract	$431

Prices are for 5-mile private-line circuits.
LEC = Local exchange carrier
CAP = Competitive access provider
SOURCE: TELECHOICE, INC., VERONA, N.J.

the figures on network management systems at the operating centers if they elect to tour the operations. One caveat, though, is such checks are difficult because CAPs are not required to file network outage reports at the FCC, as the RBHCs and interexchange carriers are.

PRICE COMPETITIVE

An ever-present factor in evaluating almost any service is price. Unfortunately, this is a difficult factor to quantify since CAPs keep their actual pricing close to their vests. Practical experience says that CAPs can prove to be as much as 15% lower than local exchange carriers for an equivalent circuit; exactly how much an end user can save depends on service ordered, size of contract, and volume and term commitment.

Due to the wide spectrum of pricing for CAP services, the Buyer's Guide chart does not offer such data. Pricing for CAP services ranges all over the map, but their structures largely follow their local exchange carrier counterparts for easy comparison. In general, the leased connection services, such as private lines and access links, are fixed-cost services, based on mileage across the CAP network.

High-speed LAN interconnection services are usually fixed-cost connections, too. Switched services are generally priced on a per-minute basis.

Most CAPs have taken a more simplistic approach to pricing than the local exchange carriers have. Most additional fees, such as multiplexing and collocation fees, are merely figured in as part of the overall price of a circuit. So instead of receiving a bill that contains hundreds of elements for various connections, CAP bills are likely to be easier to understand. There are simply fewer nickel-and-dime fees on CAP services.

CAPs also have greater regulatory flexibility to meet requests for custom services with a minimum of hassle. Additionally, all three major interexchange carriers have displayed a willingness to work with and resell CAP services at customers' requests. Interexchange carriers have recently begun to offer users volume discounts on CAP local access service that they resell. That means the interexchange carrier may be able to offer end users a better price on access than they could obtain on their own.

Both AT&T and MCI Communications Corp. now have volume discount plans for CAP local exchange access. AT&T's T1.5 Access Multi-Service Volume Pricing Plan announced last May is an extension of its Multi-Service Volume Pricing Plan. The new plan provides customers signing up for a five-year contract with as much as 10% off CAP local access rates. MCI's Access Pricing Plan can knock off as much as 24% from the access charges for a five-year commitment.

MCI began supporting 24 access providers in May under its Custom Access umbrella. At that time, MCI also announced its Access Pricing Plan, which offers volume and term discounts for access through either the local exchange carrier or selected CAPs. The end result for customers: Lower prices than local exchange carrier access, integrated access across multiple services and end-to-end network management. AT&T offers a similar plan under its Access Multi-Service.

Volume pricing plans

Users have expressed mixed feelings about purchasing access through the interexchange carriers. Each method has its advantages, says First Data's Townsend. "The [interexchange carrier] may offer you a simpler trouble resolution path, but we have had no problems when dealing directly with our CAP."

Eric Shafer, communications analyst at Norwest Technical Service, Inc. of Des Moines, Iowa, said he agrees. "We negotiated a pretty good deal with MFS Communications on our own. I'm not sure the [interexchange carrier] would add much," he says.

Mark Malacoff, manager of communications at The M.W. Kellogg Co., a Houston company that designs and constructs oil refineries worldwide, adds, "It depends on the situation. I cannot say that there is an advantage either way."

The importance of price to end users will vary. For some, the decision between a CAP and a local exchange carrier becomes a matter of economics — the less expensive means wins out.

"For us, the purchase of each circuit is simply a business decision," says Ray Waters, manager of communications at M.W. Kellogg. "If performance and service issues are about equal, it comes down to cost."

M.W. Kellogg uses more than one CAP and enjoys the flexibility of the competitive market. "You approach access differently because you have a choice, you can make the vendors meet your requirements," Waters adds.

UNIQUE SERVICES

One other issue that is beginning to drive users to CAP services are the native LAN services now being offered by MFS Communications and TCG. These services consist of a high-speed connection and carrier-provided LAN bridging, services that are becoming popular from interexchange carriers, value-added network (VAN) providers and, increasingly, RBHCs.

Both MFS Communications and TCG offer these services at 100M, 16M, 10M and 4M bit/sec. MFS Communication's High Speed LAN Interconnect Service is offered through its MFS Datanet subsidiary; TCG's service is dubbed LANLink.

Overall, usage of these services by end users is low, and they compete with services from VANs and interexchange carriers rather than from local exchange carriers. In other words, they are wide-area services for which there are many options on the market.

Some local exchange carriers, such as Nynex Corp., are responding to these services by pushing out their own Asynchronous Transfer Mode (ATM) services on a limited basis. But with their SONET-based networks, many CAPs won't be far behind in offering ATM.

First Data's Townsend is looking down the road for these high-speed LAN services. "We might consider these services in the future, but it is not really a priority today," he says.

For the most part, there are simply other options that are more appealing. Most users have implemented their internetworks using their own bridges or routers — with interexchange carrier private lines — and many seem reluctant to make a move to this type of service. Users who are making a move seem to be trying out frame relay for lower speed interconnection at a lower price.

Local exchange carriers are also vying for this business with their own high-seed LAN interconnection services. CAP services have the advantage of providing users with a LAN-type interface rather than requiring users to purchase a router and other network access equipment. On the other hand, users are limited to a single protocol on their network when using CAPs.

CHOOSING CAPS

As discussed, there is a range of issues to

Users look for redundancy

Of 52 readers recently interviewed in a *Network World*/Focus Data, Inc. survey, 46% said they prefer to purchase services from both a competitive access provider (CAP) and local exchange carrier to have truly redundant connections.

CAP selection criteria
Based on highest possible score of 10

Criterion	Importance rating	Satisfaction rating
Service reliability	9.4	8.4
Financial stability	8.3	8.5
Network composition	7.9	8.4
Circuit provisioning times	7.8	7.5
Price	7.8	7.4
Availability of LEC-type services	7.7	8.0
Network management	7.4	7.2
Billing options	7.2	6.8
Geographic expansion plans	7.1	6.7
Availability of native LAN-speed services	5.4	7.8

CAP = Competitive access provider
SOURCE: FOCUS DATA, INC., FRAMINGHAM, MASS.

"We have redundant lines, some from MFS [Communications Company, Inc.] and some from New York Telephone [Co.] coming into our building," says one reader whose comments were typical of those surveyed. "This way we have real redundancy, genuine redundancy. Without two vendors, in the event of the ultimate backhoe incident, you only have a fifty-fifty chance of staying up, and that has happened to us in the past."

Of the 52 readers interviewed, 34 currently use a CAP service and 18 are evaluating CAP services for purchase within the next year. Of the readers interviewed, 33% said they would choose a local exchange carrier, 21% said they would chose a CAP, and the rest would support both.

Readers who prefer CAPs to local exchange carriers cite several reasons, including faster and more flexible responses to customer service requests, shorter circuit provisioning time and, in some cases, lower cost and availability of native-speed local-area network transport services.

While readers on average ranked the availability of native-speed LAN services as by far the least important factor influencing their decision to purchase a local exchange carrier or CAP service, many indicated that this factor will soon become increasingly important. "We are going to look at expanding our LANs," one reader says. "So I would rate the availability of native LAN speeds much higher in the next six months than I rate it now."

And readers overall believe CAPs are quicker to support new technologies. "The CAP tends to have better technical service and is more customer-oriented," one reader says. "They are flexible, and there is a better corporate culture and less bureaucracy [than in a local exchange carrier. They also have quick answers and answers that are straight."

Another reader is impressed with how willing CAPs are to satisfy user needs. "CAPs offer better response, both for telephone support and for new technologies. For example, CAPs have displayed a willingness to establish collocation of [customer network access equipment] at their sites."

However, some readers say they regard the local exchange carrier as a safer bet due to its greater financial stability, extensive experience and larger, more comprehensive networks.

"I would prefer to go with a LEC because it has financial and engineering stability," one reader says. "If a CAP has three customers and two of them quit, they might not continue to offer a particular service. The LEC also has a bigger overall network."

Another factor that readers weigh when considering purchasing a service from a CAP or a local exchange carrier is CAPs' uncertain and evolving regulatory status. Ten percent of those surveyed said this factor "extremely" deters them from purchasing a CAP service, 38% said it deters them "somewhat," while 44% said it doesn't deter them at all. The remainder did not know its effect.

CAP services in use

Service type	Number of readers
Dedicated	49
Native LAN speed	13
Switched	8

CAP = Competitive access provider
SOURCE: FOCUS DATA, INC., FRAMINGHAM, MASS.

Not surprisingly, many readers say the bottom line in their decision is the greenback. "Cost is everything," notes one reader. "We want cheaper circuits."

BY KYLE NITZSCHE

Focus Data, Inc., a Framingham, Mass.-based market research firm, gathers data from end users to determine net and information system usage, trends, needs and user satisfaction levels. For information, call Mona Dabbon at (508) 626-2556.

consider when evaluating CAPs vs. local exchange carriers.

Some users, however, may be lucky enough to have a choice between or among CAPs, and the most significant issue then is to look at carrier size and reputation.

The CAP market has been undergoing some degree of consolidation, and many providers are not yet profitable.

When making a strategic decision to partner with a provider for access or other services, users certainly want to be sure that the carrier will be around for a while. And most CAPs have some track record and can offer references. Checking out financials will help, too; a call to a local stock broker will also yield some data on the firm from a third-party perspective.

Of the two largest CAP providers, MFS Communications posted a loss of $4.12 million in the second quarter due mainly to network investment, while TCG will not publicly disclose financial information because it is a privately owned company.

End users with multiple locations may want to turn to a single CAP that serves multiple cities, as opposed to using multiple local CAPs to get integrated billing, network management and service support.

This aspect is particularly important for users looking to connect two or more corporate sites rather than using alternative access to an interexchange carrier because the larger CAP is likely to have greater coverage within a single city.

On the other hand, there are several other CAPs providing service in secondary markets that are likely to be extremely competitive for such business and are often willing to act as a single source for service orders and trouble ticketing. These CAPs then interface with other providers as required.

THE LAST MILE

The presence of CAPs will increase pressure on the RBHCs to improve their interfaces with customers and drive everyone to develop more services. "Our CAP is well aware that they are continually competing for our business," Norwest's Shafer says.

His group shifted most of its access traffic away from US West Communications, Inc. to MFS Communications because the "MFS Communications staff was more professional and did not hide behind tariffs." Shafer notes that US West Communications continually quoted tariff regulations and bureaucratic issues that, in the end, made the RBHC simply unresponsive to Norwest's requirements. "Our relationship with US West Communications has improved now that they realize they are competing for our business."

The two-provider strategy works for more than one user. "Using two providers always keeps both on their toes," First Data's Townsend says. This ability to play one provider against another is often the single largest driving factor in choosing a CAP.

The ability for CAPs to compete effectively in the future will somewhat be determined by regulation since it has driven the major changes to date. Certainly, however, CAPs will be leading the charge in providing users with the high-speed SONET access that users will require for emerging high-speed data services such as ATM. In fact, MFS Communications has announced the availability of its ATM service in August.

For these services to be successful, they will require inexpensive and ubiquitous access at speeds up to 622M bit/sec, something end users question whether will be provided economically through the local exchange carriers.

Also likely is that CAPs will expand further into offering switched services to users of varying sizes. Currently, TCG offers some Centrex service in one or two of its markets, but it is not a major business yet. Nowhere are any of these nonaccess-oriented services a major part of a CAP's revenue.

Whether users will be chomping at the bit to buy these new services remains questionable. Some users are anxious to see what CAPs will offer in these newfangled switched services, while others are less enthusiastic.

"We would definitely consider them for switched service," says First Data's Townsend. But counters M.W. Kellogg's Malacoff, "Southwestern Bell does that really well. I don't see a need for competition there."

Still, the overall competitive pressure from CAPs is unmistakable. The bottom line is that users are benefiting from competition in every market.

The actual service is still somewhat of a commodity, but carriers on both sides of the fence are now working harder to get a corporate customer's business.

More markets are opening up, and users in remote parts of large markets are seeing greater availability and lower overall costs as CAP networks expand. However CAPs grow and change, the basic premise of a competitive carrier filling needs not met by the incumbent will make for a more friendly last mile.

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Hunting the hunter

Cable TV companies bid to unseat competitive access carriers in local exchange market.

BY MICHAEL FAHEY

It's a classic case of the hunter becoming the hunted. For years, alternative access carriers, also known as competitive access carriers (CAP), have been nipping at the heels of local exchange carriers in the local leased-line market.

Now these same CAPs are being swallowed up or threatened by cable television companies. Large cable companies, called multisystem operators, are acquiring CAPs or using systems originally built for CATV delivery to carry corporate voice and data traffic.

And thanks to this new form of competition in the local loop, the cost of local private-line service is declining and new, more widely available services are sure to be rolled out.

In response to the merger of CATV and CAPs, regional Bell holding companies are trying to shoehorn their way into the CATV industry by teaming with cable companies or starting their own cable operations.

The RBHCs' efforts got a shot in the arm recently when a U.S. District Court judge in Alexandria, Va., ruled that a provision of the 1984 Cable Act banning them from providing CATV service within their territories amounted to an infringement on free speech. The ruling came down in a case involving Bell Atlantic Corp (*NW*, Aug. 30, page 4).

However, CATV companies have been more active in stretching into the CAP market. According to Richard Tomlinson, president of Connecticut Research, a consulting firm in Glastonbury, Conn., CATV operators now own more than 40% of the CAPs in the U.S. and have investments in 10% of the others.

In one high-profile acquisition, two large cable companies, Cox Enterprises, Inc. of Atlanta and Tele-Communications, Inc. of Englewood, Colo., formed an alliance to buy Teleport Communications Group, Inc. (TCG) in the first half of 1992. In December 1992, the partners asked two other large CATV operators — Comcast Corp. of Philadelphia and Continental Cablevision, Inc. of Boston — to join them as stakeholders.

Headquartered in Staten Island, N.Y., TCG provides services for accessing interexchange carriers. It also offers local T-1, T-3, fractional T-1, switched 56K bit/sec and local-area network interconnect services at 4M and 10M bit/sec in 50 communities throughout 10 major metropolitan areas. TCG uses fiber-optic lines owned by its partners to augment its existing fiber networks.

In other cases, TCG leases or swaps facilities and rights-of-way with other CATV companies, says Roger Cawley, a TCG spokesman. "One of our customers is a bank with four locations on Long Island [N.Y.]," he says. "We were able to serve all of them except for one." To reach that one location, Cawley notes that TCG leased capacity from a local CATV system operator.

During the past few years, the CATV operators have been furiously installing fiber-optic cables in their systems. The fiber increases the reach and signal quality of the systems and enables CATV companies to consolidate their operations, saving money on equipment, personnel and real estate.

It is the deployment of these fiber-rich networks, combined with changes in the regulatory environment, that has positioned CATV companies to compete in the alternative access marketplace.

Adelphia Cable Communications, Inc. of Caudersport, Pa., is an example of a cable company that is aggressively pursuing alternative access customers. But rather than adopt an acquisition strategy, Adelphia formed a subsidiary, Hyperion Telecommunications, Inc. to provide CAP services. The company is also joining with other cable companies to enter the CAP business in such cities as Jacksonville, Fla., and Albany, Buffalo and Syracuse N.Y.

The provision of CAP services in even smaller markets is another feature of CATV involvement in the business. Adelphia is currently building a fiber network that will connect its CATV facilities throughout Vermont and portions of eastern New Hampshire. In addition to saving money by eliminating duplication of facilities and personnel, the consolidation will enable Adelphia to provide more channels and pay-per-view offerings.

When the network is completed, Adelphia's Hyperion subsidiary will offer a variety of fiber-based high-capacity services to business users and long-distance carriers. The firm's rural Vermont net is situated in a region that could not otherwise support a CAP.

By providing additional alternatives to local exchange carriers, the new CATV-owned carriers are helping to drive down the cost of special access service, the local portion of private-line service, says Connecticut Research's Tomlinson.

He explains that the price-pressure works this way: When CAPs first begin business, interexchange carriers purchase the bulk of their services, opting to pay the CAP instead of a local exchange carrier for connecting them to large end-user sites. This lowers the cost for the interexchange carriers but does not usually drop prices for end users because the interexchange carrier passes along the local access charge it would have paid to the local exchange carrier.

Once they are established, however, CAPs begin to market their services directly to end users, and a big selling point is the promise of lower private-line charges.

"What you see is an increase in revenues for the alternate access carriers and a drop in costs for end users," Tomlinson says. "The user is getting better prices, and the revenues per circuit are going up for the [competitive access carriers] essentially because they are eliminating the [interexchange carrier] as the middleman."

Recent Federal Communications Commission rulings that enable CAPs to collocate equipment in local exchange carrier central offices and give them the right to carry switched traffic provide additional incentives for cable companies to get into the market.

Prior to the FCC's co-location decision last fall, users had to be in or near buildings reached by a CAP's network. As a result of the ruling, a CAP can utilize local exchange carrier central offices as a handy concentration point for collecting traffic from users that its network does not reach.

In this case, users would send traffic over a local exchange carrier circuit to the local exchange carrier central office, where it would be passed off to the CAP.

Moreover, the FCC recently granted CAPs the right to provide access to long-distance switched services on top of the already permitted access to long-distance leased-line ser-

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TCG to build fiber nets

Already owned by four cable television companies, Teleport Communications Group, Inc. (TCG) announced in June plans to establish joint ventures with 11 other major CATV system operators to build new fiber-optic networks in five cities and expand existing fiber networks in eight others.

The new fiber nets will be built in Detroit, Miami, Phoenix, Providence, R.I., and St. Louis. In addition, TCG's existing networks in Boston, Chicago, Dallas, Houston, Los Angeles, San Diego, San Francisco and Seattle will be expanded.

TCG's new joint venture partners are Cablevision Industries Corp., Crown Media, Inc., Hyperion Telecommunications, Inc., InterMedia Partners, MacLean Hunter Cable TV, Times Mirror Cable Television and Viacom Cable.

TCG's current owners, Comcast Corp., Continental Cablevison, Inc., Cox Enterprises, Inc. and Tele-Communications, Inc, will also be partners in the joint venture.

While the CATV operators have boldly moved into the competitive access provider (CAP) business through acquisition and start-ups, existing CAPs have been less inclined to take the lead in partnering with CATV providers.

However, MFS Telecom, Inc., a subsidiary of Metropolitan Fiber Systems, Inc., and a major CAP with networks in 14 U.S. metropolitan areas, also announced in June that it is joining with MH Lightnet to build a fiber-optic network that will provide competitive access service in northern New Jersey. MH Lightnet is a subsidiary of Toronto-based MacLean Hunter, a communications company with interests in telecommunications, cable, broadcast communications and publishing.

BY MICHAEL FAHEY

User hooks to CATV CAP

When Dawn LaRue-Kimminski, telecommunications manager at Epsilon Data Management, Inc. in Burlington, Mass., was bypassing New England Telephone, she wanted the type of flexibility and promptness in provisioning new lines that competitive access providers promise to deliver.

However, such services weren't available to users in Burlington until this year, when Teleport Communications-Boston, a unit of Teleport Communications Group, Inc. (TCG) began offering them.

TCG is able to reach customers in Burlington by using fiber installed and maintained by Continental Cablevision, Inc., the local cable television franchise holder and part TCG owner .

Cablevision technicians installed and continue to maintain connections that link Epsilon's Burlington locations to TCG's Boston network. TCG provides Epsilon with six T-1 circuits, switched 56K bit/sec service that interconnect local-area networks at remote sites.

LaRue-Kimminski says she had no concerns about the CATV company's role in linking her with TCG's services. She adds that the arrangement is somewhat akin to one in which Epsilon's private branch exchange was purchased from Rolm but installed and maintained by a third party.

TCG's experience in providing network services was a major factor in choosing the company, LaRue-Kimminski says. However, she would consider doing business in the future with a lesser established CATV company that offers network service if that firm demonstrated the abilitity to meet Epsilon's communications needs.

BY MICHAEL FAHEY

vices. This enables CAPs to compete for a slice of the $20 billion switched access pie.

With special access charges accounting for at least a quarter of their revenues, local exchange carriers are very concerned by the proliferation of CAPs and CATV operators that provide CAP services. Those fears go beyond competition for access charges. Local exchange companies envision future residential and wireless competition from the cable companies, which pass 80% of U.S. homes and deliver service to 60% of them.

Local exchange companies are also casting a wary eye toward long-distance carriers, which they see as potential competitors for local exchange service. AT&T's purchase of McCaw Communications, Inc. has particularly ominous overtones since AT&T could provide local access to long-distance services over a wireless net, albeit expensive.

In response to the threat of competition, Chicago-based Ameritech and Rochester Telephone Corp. in New York, have proposed plans to restructure the local loop. Essentially, the plans call for the telephone companies to provide local services to all comers, including their own subsidiaries, which would then be free to offer a variety of enhanced services.

Ameritech's plan calls for the freedom to provide its own operating-area long-distance and CATV services, both of which it is currently forbidden to offer. But Ameritech does not expect to win such a wholesale turnabout in regulatory policy, says Mark Lowenstein, associate director at The Yankee Group, a consulting firm in Boston. Instead, Ameritech understands that the competitive landscape is rapidly changing and is seeking concessions to enter currently forbidden markets in return for agreeing to avert a fight to prevent others from entering the local exchange market.

US West, Inc. responded to the CATV threat in a join-them rather than beat-them move when it bought a 25% stake in Time Warner, Inc. However, to avoid regulatory nightmares, US West sold eight Time Warner cable companies that operate within the US West region. Those eight companies served only 85,000 of Time Warner's seven million subscribers.

Of the $2.5 billion US West is investing, $1 billion will go toward rebuilding Time Warner's systems, including installation of fiber optics, Synchronous Optical Network and Asynchronous Transfer Mode equipment.

Other local exchange carriers may show interest in offering CATV services due to to the recent court ruling in Bell Atlantic's favor.

All of this is good news for users, which will be able to avail themselves of the latest in high-speed services, Lowenstein says.

➸ Fahey is a free-lance writer in Arlington, Mass., and can be reached via MCI Mail at 360-8425.

Letters

Continued from page 33

ing certified by a firm that created and manufactured the software? Will a CNE be attractive to a company that does not use NetWare?

One solution is to look at independent professional societies that certify information systems (IS) personnel, not only in networking hardware/software elements, but also in computer technology in general.

The IS industry can be assured that these certified professionals have passed several stringent tests that demonstrate their knowledge of information science is much broader and, in some cases, deeper, than the CNE exam could possibly accomplish (yes, I have taken and passed parts of the CNE exam).

Instead of taking the CNE study courses and exam, one could use the money to receive a very respectable master's degree from many state and private universities, which in the current job market, could be much more in demand than a CNE designation.

John Rader
Systems analyst
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The numbers game

Give me a break! I have now seen several articles and a Letter to the Editor about the "problems" that will be caused by eliminating 1 + seven digits for in-area-code toll calls (July 12, page 35). What about the problems we poor travelers have when we try to call within the same area code and have to keep trying because we don't know if the call is a toll call.

I live in the Los Angeles metropolitan area, and for as long as I can remember, have never used 1 + seven digits for toll calls. If the phone number is in the area code, it's seven digits; and if it is out of the area code, it was 10 digits. That changed to 11 digits when we had to dial 1 before an area code a decade or two ago.

Now granted, most of the area codes in this area are almost small enough that a large percentage of calls in an area code are local. In case you are wondering why this is the case, there are seven area codes in the greater Los Angeles area (213, 310, 818, 714, 909, 619 and 805). We have gotten very used to phone numbers being considered to have 10 digits, not seven because we always give the area code.

As to the excess toll charges caused by not having 1 + seven dialing for in-area-code toll calls — tough. If I'm making a call on a personal basis, I don't really care if it's a toll call or not; I make the call and then hang up. For a business, I can't think of any that restrict phones to just local calling for most employees. If they do, it sure does not say much about trusting the employees.

If you count the number of lines that are private branch exchange-provided and do not have intelligent toll restriction, the percentage is not all that large. If you are thinking, what about just restricting 1 + anything boxes, that is not practical around here. My local dialing circle from my house includes portions of three area codes, and from my office, it's two area codes. I routinely dial 11 digits for local calls that are not in my home area code.

When I travel, I find 1 + seven digits to be a real pain in the neck. I find I am forever dialing seven digits only to get a recording telling me I have to dial a 1 first, or trying the 1 + seven only to get a recording telling me 1 must dial again without the 1.

One last note. The intended purpose of 1 + seven dialing as a toll alert is not working for a large portion of the nontelecommunications public. I took an informal survey of friends and relatives in an area that uses 1 + seven-digit toll alerting to see if they knew why they had to dial 1 for some calls. Out of about 20 people, not a single one knew that if they had to dial a 1 first, it was a toll call. Most of them knew that it was not a call in their town, but none knew dialing 1 indicated it was a toll call.

So forget the toll alerting everywhere so that we can really have a universal dialing plan that works everywhere without having local variations.

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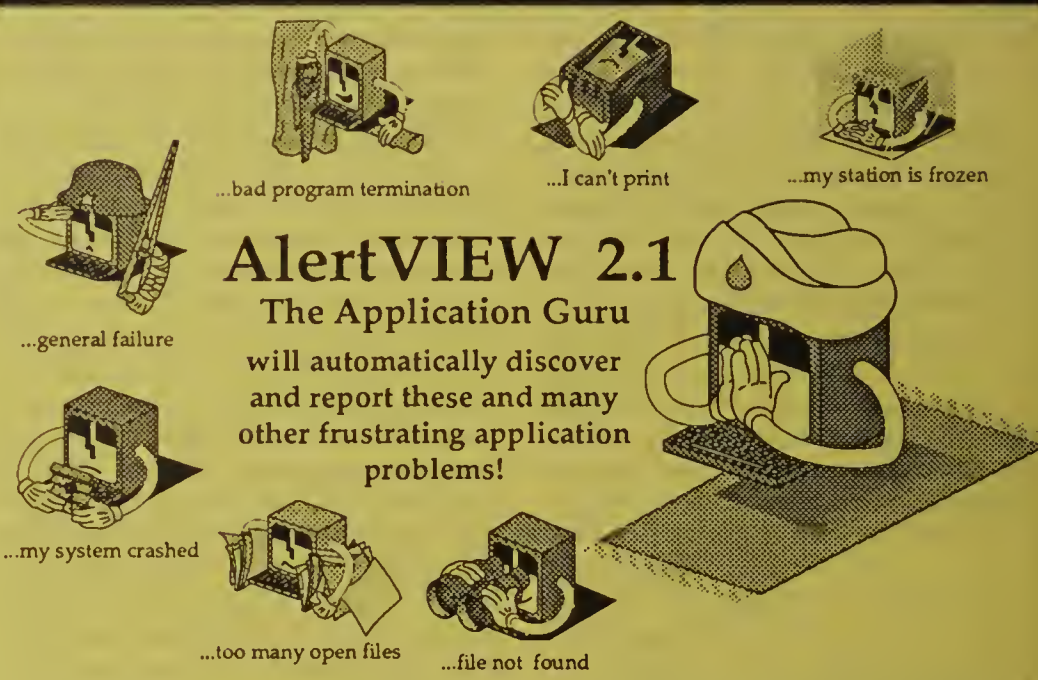

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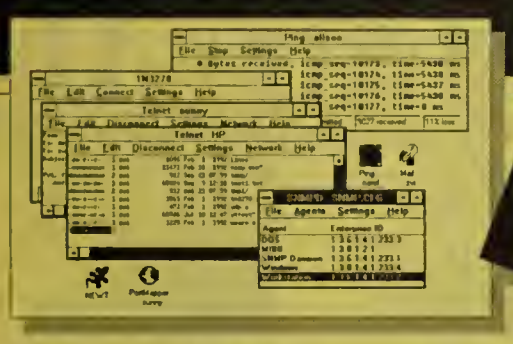

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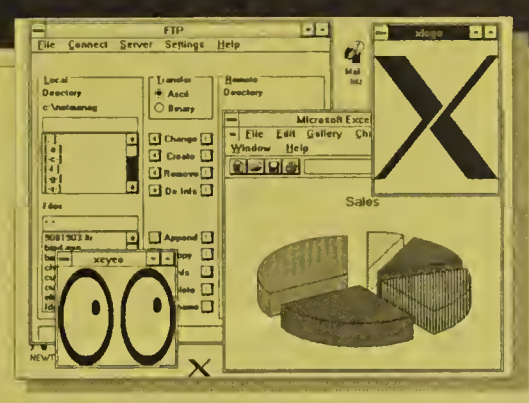

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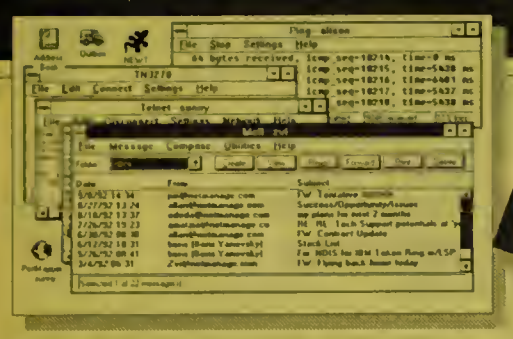

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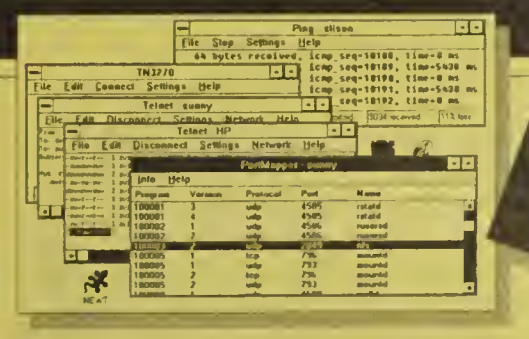

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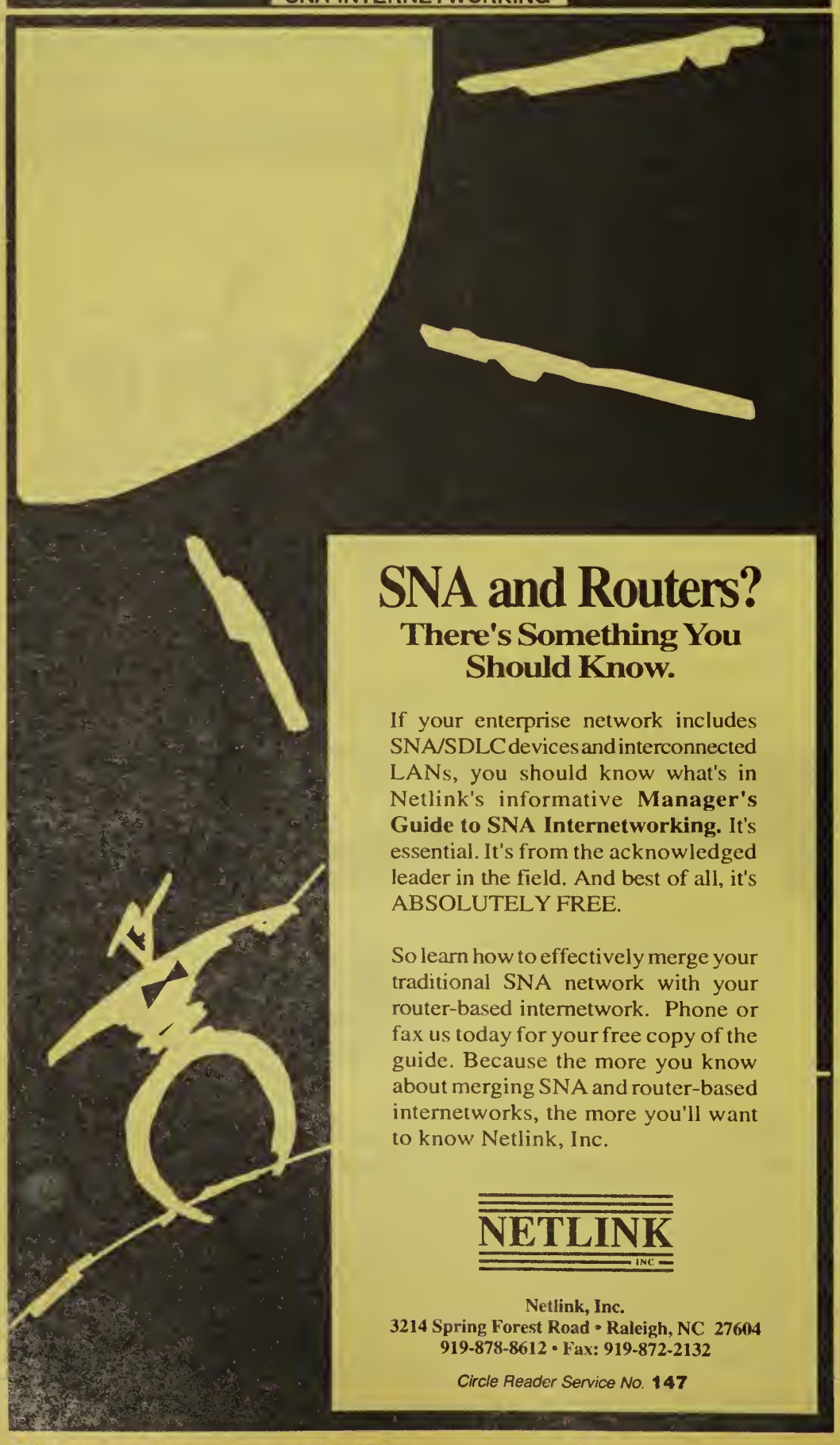

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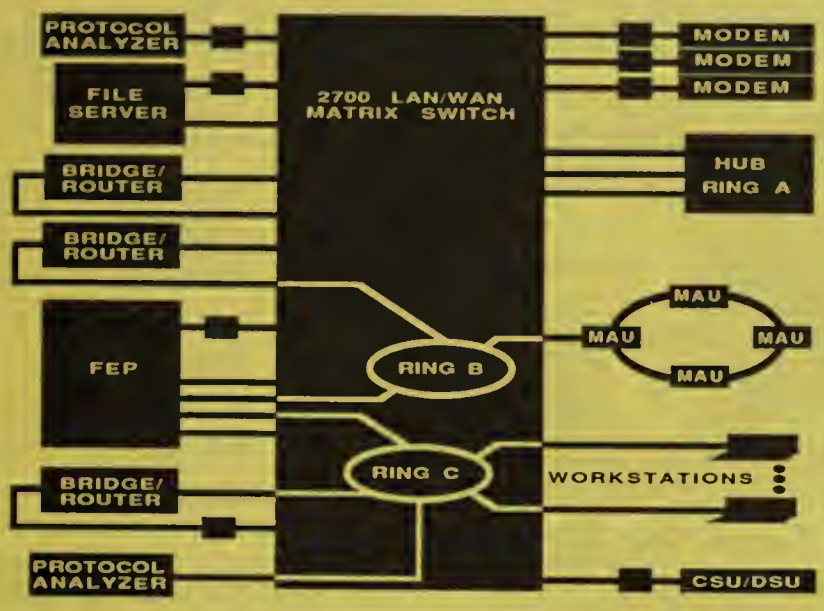

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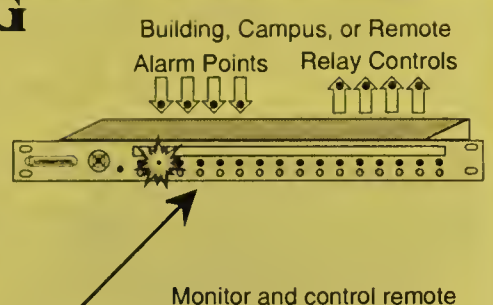

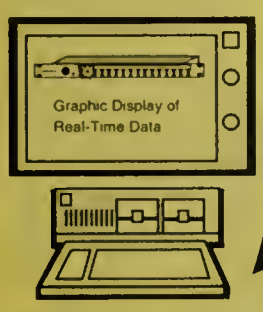

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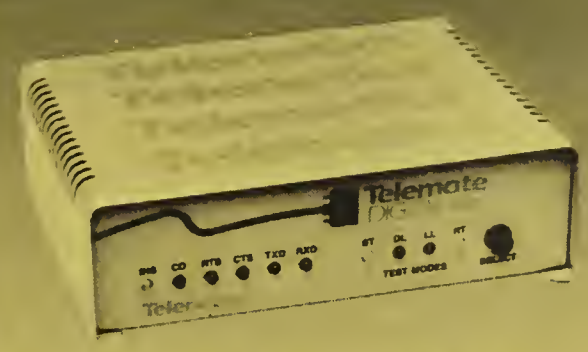

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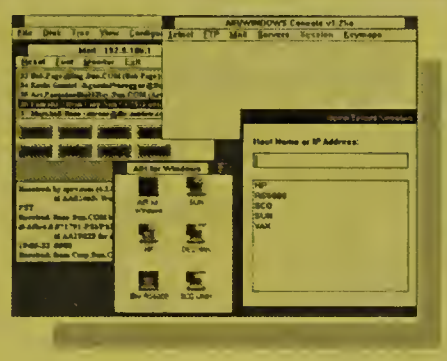

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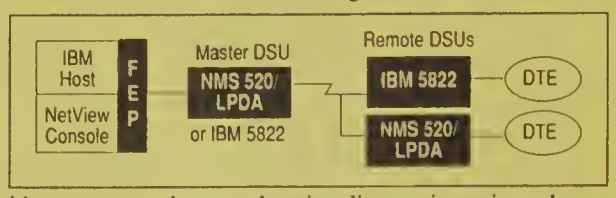

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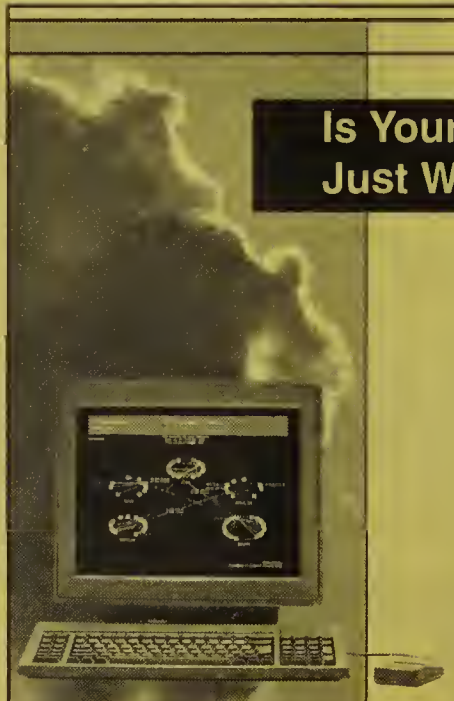

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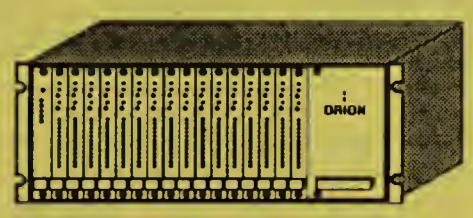

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Bell Atlantic is installing a digial fiber-in-the-loop video dial tone system for the transport of video programs and text services supplied by independent content providers. The initial system will be installed within the territory of New Jersey Bell OTC in the second half of 1993.

As part of this service, Bell Atlantic is providing an upgrade to its operations, administration, management and provisioning (O,A,M, & P) system that was the subject of the network disclosure published on February 22, 1993. This upgrade will provide Video Information Providers and Text Service Providers with the ability to offer video services and text services to their customers in the trial areas. This equipment is manufactured by Broadband Technologies, Inc. (BBT)

The text service will enable Text Service Providers with the ability to transmit textual information to end users over the Video Dial Tone network. Video Information Providers and Text Information Providers will obtain services using this equipment through tariffed private or special access lines and Public Data Network services.

The Bell Atlantic document referenced in this network disclosure provides details of the physical network interface equivalent to OSI layer 3. Details of the presentation and application layers, included in OSI layers 4 through 7, may be obtained directly from BBT.

The revised documentation that provides this information is available from BBT as follows:

BroadBand Technologies, Inc. Document - Generic VIP FLX Technical Specification TESP 0106 Price - available from BBT.

Ordering Information:

Write to the following:

BBT
Customer Service Dept.
Attn. Judy Kamin
P.O. Box 13737
Research Triangle Park, NC 27709-3737

The previously released documentation covering the interface requirements is available as follows:

Bell Atlantic Document #TR72530
Price $0

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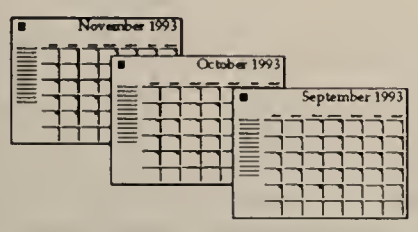

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Unix

Continued from page 1

vendor with the confidence that those applications will run on any Unix implementation. "There will be multiple kernels but one way of talking to the kernels," said Marc Shulman, president of Technology Strategies Group.

Development of the API is another step in the unification of the heretofore fractious Unix community, which is racing to shore up its defenses against the expected onslaught of Windows NT.

DANILLE SWICK

HANLOCK

"The selection of an [operating system] supplier should be a matter of economic choice," not one based on which firm dominates the market, said Peter Cunningham, president and chief executive officer of Unix International. Application consistency across multiple versions will make Unix more appealing to users.

The API addresses kernel-level issues not addressed by the Common Open Software Environment group, a Unix unification group that debuted in March with support from many of the same key players. The group is addressing common application and services issues, such as graphical user interfaces, networking, and systems and object management services.

"This is a major step in enabling us to realize open systems," said DHL's Len Hanlock.

The API melds application interface definitions from OSF, UI, X/Open and some of the more popular applications used today. They include OSF's Applications Environment Specification for OSF/1, UI's System V Interface Definition for Unix System V and the X/Open Portability Guide 4. With the common API, developers should be able to write a single version of an application — a group scheduler or trouble-ticketing system, for example — and simply recompile it for different Unix platforms. Today, developers have to customize applications for each version of Unix, which is costly, limits the appeal of Unix and creates interoperability problems for users.

"This portends an exciting time ahead for us," said Len Hanlock, chief information officer at DHL Worldwide Express, Inc. in Redwood City, Calif. "This is a major step in enabling us to realize open systems. We will be able to treat third-party software the same way as internally developed software."

The specification does not have a direct impact on the net application efforts of the parties involved, like the OSF's Distributed Computing Environment (DCE) and Distributed Management Environment (DME), or UI's UI-Atlas framework. But users will be able to deploy Unix implementations of DCE, DME and UI-Atlas applications knowing that they will run across any Unix version, UI's Cunningham said.

Some modification of existing applications will be required to make them compliant with the API, according to Unix vendors. The API is now up for review, which is expected to conclude in November. They will then be submitted to X/Open for inclusion in its Portability Guide. Product compliance testing and certification will take place toward mid-1994, and compliant products are expected in the second half of 1994.

✆OSF: (617) 621-8700; UI: (201) 263-8400; X/Open: (415) 323-7992.

Bridges

Continued from page 1

dustry acceptance due to users' preoccupation with the Open Software Foundation, Inc.'s Distributed Management Environment.

"It's one of these things that's worth watching," said David Passmore, vice president and service director at Gartner Group, Inc. in Stamford, Conn. "But I don't know that you're going to see this result in mainstream implementation on industry-leading platforms like [IBM's] NetView/6000 or [Hewlett-Packard Co.'s] OpenView."

Forum officials say OME is consistent with the OSF's DME concept and is intended to allow users to realize the benefits of DME-like functionality today while development proceeds on DME, one of the standards supported by OMNIPoint.

The actual OME code, which includes a protocol engine and a request broker for exchanging messages with other applications, can be incorporated in any management application running on platforms like SunConnect's SunNet Manager.

When a management station receives a message concerning a significant event, such as degrading router performance, the event will be handed off to an OME-equipped management application, which will then issue a message to the request broker seeking more information on the faulty device.

Once the broker has identified the network device that can provide the information, it uses OME's protocol engine to engage the transport protocol or call routine necessary to communicate with that device. It then routes the message accordingly. The application will then send information back to the inquiring application via the same protocol and call translation procedures.

Users can program OME's protocol engine to support any protocol or call routine in their network.

AIMS members recently ran a prototype OME environment in which five different applications used five separate data exchange methods — Simple Network Management Protocol, Berkeley Sockets, Open Systems Interconnection, SQL and remote procedure calls — to swap information.

Cable Act weakened as FCC lets telcos into wireless cable

BY BILL BURCH

Washington, D.C.

Local telephone companies got a second avenue into cable programming last week when the FCC ruled that the 1984 Cable Act's prohibition on cross-ownership of telephone and cable television systems does not apply to the emerging area of wireless cable systems.

Wireless cable technology involves microwave transmission of a multichannel television signal over a radius of 50 to 60 miles. Currently, 140 wireless cable systems provide service to 400,000 subscribers in the U.S. Metropolitan areas with wireless cable systems include Corpus Christi, Texas, Riverside, Calif., and Tucson, Ariz.

The Cable Act bars the regional Bell holding companies from owning cable operations in their own regions. Last month, a U.S. District Court in Alexandria, Va., overturned that ban, calling it an infringement on free speech. While that decision will likely be tied up in appeals, the FCC's ruling gives the RBHCs a second avenue into the cable business. Both decisions are likely to spur network upgrades as the carriers move into the new market.

Last week's ruling stemmed from an FCC review of applications for three television licenses in the Roanoke, Va., area. According to their applications, the school boards of Botetourt County, Roanoke County and the city of Salem planned to rely on Botetourt Communications, Inc. to transmit programming.

That deal with Botetourt Communications, the parent company of Roanoke and Botetourt Telephone Co., would violate the Cable Act's ban on cross-ownership, rivals argued.

But the FCC disagreed, saying the Cable Act only bars common carriers from transmitting video programming over cable systems and does not apply to wireless cable. When Congress passed the Cable Act, it meant to avoid monopoly control of wired systems into the home, said Jerry Vaughn, deputy director of the FCC's Common Carrier Bureau. Vaughn pointed out that the RBHCs' cable ventures will still be constrained by the Consent Decree's prohibition of interlocal access and transport area service.

Paul Sinderbrand, counsel for the Wireless Cable Association International, Inc., said the order is important because it resolves the question of whether the cross-ownership ban applies to wireless cable.

The industry won a legislative boost last year with the passage of the 1992 Federal Cable Act, which gives wireless cable operators access to popular commercial programming.

Previously, the operators had been locked out of access to the programming by agreements between production and land-line cable companies.

Now that they have access, the association predicted, the number of wireless systems will double each year for the next three years, and wireless cable should have a major presence in the top 50 markets within five years.

LAN Server

Continued from page 1

service, which provides transparent access to files anywhere on the net, and Paladium, a printer protocol defining how servers talk to printers in enterprise nets, will be included in a later version of LAN Server.

King said IBM will switch LAN Server's character-based command-line installation and configuration interface to a GUI. "When using a command line, you've got a lot of details to remember, and that slows you down," said Ellen Minoque, a systems administrator at IBM headquarters in White Plains, N.Y. A friendlier interface will save managers time, she said.

Another enhancement in 4.0 will be better peer support. LAN Server 3.0 peer services let a client share resources with other clients, but only one peer session can be opened at a time.

Kim Wilkens, product manager for OS/2 LAN Server peer services, said LAN Server 4.0 will support five to 10 simultaneous peer sessions. The enhanced peer services will support Dynamic Data Exchange and Dynamic Clipboard, allowing peers to link Windows-based applications across a network and providing for changes made within one application to automatically update the other. Finally, IBM pledged to offer LAN Server 4.0 on Pentium platforms and add support for Multi-Protocol Networking Services, an IBM product that enables applications running different transport protocols to communicate.

LAN Server 4.0 will have native Transmission Control Protocol/Internet Protocol support, providing connectivity with IBM's AIX and MVS platforms.

LAN Server users were cautious about IBM's plans for LAN Server 4.0 and called for enhancements in other areas, particularly system security.

"I'm not interested in the pleasantries, the nice GUI or the convenient peer service, because what I want is functionality," said Patrick Thomas, senior systems engineer at K-Mart Fashions in North Bergan, N.J. Thomas, a LAN Server 3.0 user since February, said IBM needs to address LAN Server 4.0 security.

"You have to jump through hoops to get into your LAN Server security file to change a password," he said. The security functions should mimic Novell NetWare security, giving administrators blanket supervisory rights that allow them easy access to all high-security files.

John Quigley, an assistant systems administrator for Standard Register Co. in Dayton, Ohio, echoed Thomas' complaints. When a server crashes, the local security system makes it impossible to bring it back up without reformatting the server, Quigley said. "You can't log on because you need to access a security file to validate your password," he said, "but you can't access that file because you can't log on."

✆IBM: (800) 426-2468.

Replication

Continued from page 8

can also be used to specify which location of a database has priority in making updates to a table.

Another key Replicator feature is its support for cascade replication. This means the recipient of replicated data can propagate the information throughout his own network using a distribution list set up at the Replication Monitor.

David McGoveran, president of Alternative Technologies, a Boulder Creek, Calif.-based consulting and analysis firm, gave the Replicator high marks.

"It will be a significant product for users who want replication services that are easy to use yet offer comprehensive features," McGoveran said. "The ability of handling and resolving conflict resolution between systems presents a definite advantage over how other vendors have handled this critical problem."

Replicator, which will be sold as a separate product by Ingres, requires no application coding to take advantage of replication services. Shipments to selected customers have already started, and the product will be generally available in the fourth quarter. Pricing has not yet been determined.

Novell

Continued from page 1

years, as opposed to some 70% today.

The other 50% will come from the more than 1,500 other products Novell sells, with application development, Unix, internetworking and net management products leading the pack. "People think of Novell as just selling NetWare," Tolonen said. "Our non-NetWare business is between a $300 million and $400 million business today."

REKHI

But observers agree that the company has not been clear about where these products fit into its corporate plan. Novell seems to be lacking focus and needs to make its corporate vision clear to users, analysts said.

"For the past year and a half, we've viewed Novell as increasingly rudderless," said Tom Nolle, president of CIMI Corp., a consulting firm in Voorhees, N.J. "It seems like they're just banging around out there."

To date, Novell has always had Chief Executive Officer Ray Noorda to steer the company and provide visionary speeches, but even he has been removed from Novell's day-to-day operations, thanks to a recent restructuring.

Analysts said the company must now answer some fundamental questions: What has it got planned for NetWare? What types of services will be built into the network operating system, and when will NetWare be able to run on different platforms? What role will NetWare play in relation to the other areas into which Novell is putting more and more money?

JOHN COLETTI

TOLONEN

Most of Novell's users and third-party developers said they want Novell to stick with the basics of NetWare.

"We wish Novell would concentrate on NetWare networking issues, like getting servers to talk to one another," said Umesh Verma, president of Blue Lance, a software company based in Houston. "They seem to be moving into the application area and the desktop area at the expense of NetWare itself."

Novell execututives stressed that in order to understand the company's NetWare direction, it is important to understand how NetWare has grown from its origins as a network operating system that provided primarily file and print services.

"Today, when we think of NetWare, we think of NetWare as an environment, not just a single operating system product," said Bob Young, director of NetWare product marketing at Novell. "We believe it encompasses the hardware that plugs into it, the applications that plug into it, the networking services." With that in mind, the company plans to build much more into basic NetWare.

NetWare 4.X is the strategic platform on which Novell will build higher end services.

"As NetWare is transformed from a file server to an enterprise platform, the services users need will all be built-in," as opposed to being add-on products like many are today, said Kanwal Rekhi, Novell's executive vice president and general manager of its Unix Systems Group. "We intend to build in [Message Handling Service], enhanced routing, network management, imaging — everything."

That will make it easier for third-party developers to build applications that run within NetWare and for users to manage those applications.

"This way, when you're writing an application, you don't have to go through coding acrobatics," Blue Lance's Verma said. "NetWare will already be imaging- and messaging-enabled, and you can manipulate things through the [application program interfaces]."

Novell also plans to revamp NetWare 4.X to let it to run on a variety of hardware platforms with a product called Processor Independent NetWare (PIN).

"PIN will be native NetWare running on multiple hardware platforms," said Novell's Young, citing Hewlett-Packard Co.'s PA-RISC, Sun Microsystems, Inc.'s SPARC and Digital Equipment Corp.'s Alpha as three platforms the company is targeting initially. "With PIN, your choice of NetWare is independent of the server platform on which you choose to run your net."

Young said the ability to run NetWare 4.X on any platforms will require no separate products specific to each platform.

Novell will start delivering PIN software development kits by the end of this year. Next month at NetWorld 93 Dallas, the company will start educating third-party developers in how to get their products to work within the PIN environment. Young said he expects PIN to be a workable product next year, though he would not be more specific.

STEVE BOORNS

NOORDA

Also at NetWorld 93, Novell plans to beef up its 3.X line with the release of NetWare 3.12 (*NW*, March 8, page 1). Although it is primarily a bug-fix release, NetWare 3.12 is also Novell's first step toward including higher end capabilities in its middle-tier NetWare offering.

"They added the [NetWare] 4.0 menu system, the digital signature capabilities for security, the packet burst capabilities and the [Virtual Loadable Module] shell," said a user who is beta-testing the software.

DANIELLE SWICK

YOUNG

Packet burst provides improved wide-area network performance, while the VLM shell provides enhanced client flexibility by letting end users load and unload their own front-end software on demand.

Novell's Young said the firm will continue to build more enhanced services into the 3.X line but has no plans to include global directory services in the release. That, he added, will be the primary difference between 3.X and 4.X.

Novell has said it will not provide anymore updates to NetWare 2.2, its most widely installed product. Although there are currently 900,000 copies installed — vs. 600,000 copies of NetWare 3.X — 2.X sales are declining by about 100,000 copies each year.

Lotus

Continued from page 1

Lotus has had difficulty following through on a strategy for integrating cc:Mail and Notes ever since the company acquired cc:Mail in 1991. This is partly due to infighting between the Notes and cc:Mail teams over the strategic direction of cc:Mail and partly to the significant technical hurdles involved in merging the two mail systems.

In addition, the cc:Mail division has been growing at a significant clip and has been struggling to keep pace with demand for its products. The division added 2.5 million mailboxes in the past two years and last week completed a move to a new office building to house its rapidly expanding staff, which now numbers around 200.

A source within Lotus admitted that the company is sending mixed messages about its strategy for integrating Notes and cc:Mail, causing confusion that surfaced among cc:Mail users at last year's Interchange conference. Since then, Lotus has quietly reshaped its integration strategy in light of customer concerns and requirements. It has made progress partly because it has faced fewer internal conflicts. Almost all of the top cc:Mail people have left the company.

Phillipe Courtot, the former president, Shelley Harrison, the former head of marketing, and Eric Hahn, who led development, quit last year. This spring and summer, almost a dozen top product managers, programmers and salespeople resigned.

"Losing some good people was necessary to reengineer cc:Mail to be part of Lotus," said a former cc:Mail employee.

In addition, Lotus appointed Larry Crume, a 23-year veteran of AT&T Bell Laboratories, to head the cc:Mail division. Crume has brought a more decisive leadership style to the job and helped bring the Lotus strategy into focus, one source said.

Leading the departed cc:Mail employees are (l. to r.) Courtot, Harrison and Hahn.

Despite some bumps along the way, Lotus is now presenting customers with a more consistent story.

Mike Palmer, who was cc:Mail's national sales manager until he resigned three weeks ago, said Lotus this summer told many of its major customers of its plans to develop a client/server version of cc:Mail based on a Notes back end while continuing to evolve cc:Mail as a file-sharing E-mail product.

"This makes perfect sense," said Palmer, who was one of three original founders of cc:Mail. "There needs to be a client/server version of cc:Mail, and Notes already supports a client/server architecture, so why reinvent the wheel?"

Sources said Lotus has also considered developing a file-sharing version of Notes that could support cc:Mail without many modifications to the cc:Mail back end. This option has not been acted on to date, the sources said.

A client/server version of cc:Mail would give cc:Mail users access to a variety of Notes services, such as replication, security and full text retrieval.

There is also the possibility that once Lotus figures out a way to port cc:Mail to Notes, it will create client/server versions of cc:Mail that work with a variety of back-end E-mail systems.

However, developing a client/server version of cc:Mail has its pitfalls. The Notes server is not as optimized for handling E-mail as the cc:Mail engine, and Notes does not encrypt messages, unlike cc:Mail.

Also, the two have incompatible directory structures and administrative capabilities, and cc:Mail runs on many more platforms than Notes.

In contrast, building the integrated Lotus Message Switch is a relative no-brainer, according to Chuck Stegman, a former product manager at cc:Mail and now an analyst at Dataquest, Inc. in San Jose, Calif.

The hybrid switch will use a client/server architecture to move Notes messages to a Notes database and a file server architecture to route cc:Mail messages to a cc:Mail message store, a source said.

NETWORK WORLD

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